

**EGLIN AIR FORCE BASE
Florida**

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR
INTEGRATED NATURAL
RESOURCES MANAGEMENT
PLAN ACTIVITIES**



JANUARY 2013

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 28 JAN 2013		2. REPORT TYPE Environmental Assessment		3. DATES COVERED 00-00-2010 to 00-00-2013	
4. TITLE AND SUBTITLE Final Environmental Assessment for Integrated Natural Resources Management Plan Activities at Eglin Air Force Base, Florida			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Air Force,Eglin Air Force Base,Okaloosa,FL,32542			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT Final Environmental Assessment for Integrated Natural Resources Management Plan Activities at Eglin Air Force Base, Florida					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 332	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT

FOR

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) ACTIVITIES AT EGLIN AIR FORCE BASE, FLORIDA ENVIRONMENTAL ASSESSMENT

RCS 11-211

This finding, and the analysis upon which it is based, was prepared pursuant to the President's Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) and its implementing regulations as promulgated at 40 Code of Federal Regulations (CFR) Part 1500 (40 CFR 1500–1508) plus the U.S. Air Force's *Environmental Impact Analysis Process* as promulgated at 32 CFR 989.

The Department of the Air Force has conducted an Environmental Assessment (EA) of the potential environmental consequences associated with the Integrated Natural Resources Management Plan (INRMP) activities at Eglin Air Force Base (AFB), Florida. That EA dated November 2012 is hereby incorporated by reference into this finding.

PURPOSE AND NEED (EA Section 1.2, page 1-3)

The purpose of this action is to be able to quickly and efficiently process modifications in natural resources management activities and to update the NEPA analysis by re-evaluating natural resources management activities and by performing a cumulative environmental analysis of all management activities.

The need for the Proposed Action is to provide managers a quick response to new priority needs, as well as maintain the current approval process for routine activities. Additionally, some of Eglin AFB's natural resources and activities have changed since the original environmental analysis was completed, requiring new environmental analysis to be performed.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

No Action Alternative (EA Section 2.2, page 2-1)

The No Action Alternative would continue the natural resources management programs as laid out in Eglin AFB's previous INRMP for 2007–2012 (U.S. Air Force, 2009), except in situations where mission activity or policy changes have resulted in changes to the baseline, independent of natural resources management. For example, the No Action Alternative would be required to follow the same restrictions as the Proposed Action in the No and Restricted Suppression areas due to the 2011 policy change (described in Section 2.3.1, Prescribed Fire). Additionally, the locations/acreages of areas open/closed to recreation and the number of predicted wildfires are the same for the No Action Alternative and the Proposed Action; baseline numbers were not used because these changes resulted from changes in mission activity, independent of natural resources management decisions.

Proposed Action/Preferred Alternative (EA Section 2.3, page 2-1)

The Proposed Action would refocus the Eglin Natural Resources Section (NRS) program according to the five principal goals from Eglin AFB's current 2012–2016 INRMP:

1. Provide direct support and coordination services by planning for and adapting to a rapidly changing military mission.
2. Restore the longleaf pine ecosystem and recover threatened and endangered species in the Core Conservation Area.
3. Enable long-term sustainability of barrier island environments for military testing/training by protecting and maintaining threatened and endangered species and their habitats.
4. Restore, protect, and monitor wetland and aquatic habitats to comply with federal law and recover threatened and endangered species.
5. Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.

ENVIRONMENTAL IMPACTS

Analysis was conducted to determine the potential impacts to the human and natural environment resulting from the No Action Alternative and the Proposed Action/Preferred Alternative. No significant impacts to resources have been identified (EA Chapter 3, pages 3-1 to 3-92). In addition, no cumulative impacts will be caused by implementation of the Proposed Action when combined with other past, present, and reasonably foreseeable actions occurring at Eglin AFB, main base (EA Chapter 4, pages 4-1 to 4-5).

Air Quality (EA Section 3.1.2, pages 3-5 to 3-16) – Impacts to air quality are not expected to be adverse if NRS continues to take every precaution to ensure that potential impacts to the area associated with reduced air quality from prescribed burns are minimized. The largest contributor to local air quality from prescribed burning is particulate matter (PM). Although PM emissions are relatively higher, the emission concentrations are within federal standards and would not cause adverse effects to the regional air quality. Wildfires tend to be more intense than prescribed fires because they typically do not start under optimal weather conditions. The Eglin NRS has significantly reduced the threat of wildfire at Eglin AFB by prescribed fire and forest management activities. Without these programs, PM and greenhouse gas (GHG) emissions from wildfires would be significantly higher. Eglin NRS's prescribed burning program reduces the number and size of wildfires that occur on the range each year. The reduction of wildfire, coupled with the ecological benefits of prescribed fire, make it an essential part of managing natural resources. Any visibility impairments would be temporary. In addition, any emissions from herbicides used would not be significant assuming proper regulations and guidelines are followed during mixing and application.

Soils (EA Section 3.2.2, pages 3-19 to 3-22) – No adverse impacts to landforms and soils are anticipated from prescribed fire and wildfire support activities under either of the alternatives if management practices are followed. The use of established best management practices (BMPs) would serve to minimize the potential for impacts associated with forest management activities. While there may be some minor, localized impacts to soils due to ground disturbance, there

would be an overall benefit to the landforms and soils of Eglin as a result of forestry activities on the reservation. Continued erosion control activities, while perhaps having short-term, temporary impacts to water quality in areas resulting from the use of heavy equipment, would have long-term beneficial impacts to the landforms and soils of Eglin.

Water Resources (EA Section 3.3.2, pages 3-28 to 3-32) – No significant impacts to water resources are expected under either of the alternatives from the different activities. Potential short-term impacts to surface waters from wildlife support activities, forest management activities, and habitat restoration would be minimized by continuing the current management practices and implementation of additional management actions. Adherence to applicable and necessary management requirements would reduce potential adverse affects to water resources from invasive non-native and nuisance animal species. Water resource management would likely benefit from improved capabilities to identify data gaps between agency resource managers.

Biological Resources (EA Section 3.4.2, pages 3-41 to 3-59) – There would be no significant adverse impacts to biological resources under either of the alternatives from the different activities. Maintenance of an average of 90,000 acres of prescribed fire annually would have no significant negative impacts on sensitive habitats, and would have an overall beneficial effect for natural habitats on Eglin. Wildfire support activities would not result in significant negative impacts to sensitive habitats. Forest management activities would not result in significant negative impacts to wildlife and would typically result in long-term beneficial impacts. Habitat restoration would not result in significant negative impacts on biological resources, and would provide long-term benefits through habitat improvements. Invasive non-native and nuisance animal control efforts would have no significant negative effects on biological resources, and would result in long-term beneficial effects by reducing predation and habitat damage. Ecological monitoring would not result in significant negative impacts to biological resources, and would provide long-term benefits through improved management activities. Protected species monitoring and management would not cause significant impacts to biological resources, and would result in a beneficial effects for sensitive species by providing information on species status. Recreation management may have negative impacts on natural communities and sensitive habitats, primarily when the public overuses an area, but would not result in significantly adverse impacts to sensitive habitats and biological resources. Adherence to all applicable regulations, BMPs, and necessary precautions would minimize any potential damages to biological resources. Overall, natural resources management activities would be beneficial for species and habitats.

Land Use (EA Section 3.5.2, pages 3-63 to 3-64) – No significant adverse impacts to land use from recreation management are anticipated. Under the Proposed Action, the primary change in management includes a shift in land use from recreation to closed area, as reflected in the 2005 Base Realignment and Closure (BRAC) decision. The land change would result in a decrease in available hunting area by 48,106 acres (approximately 16 percent of the current available acreage available for hunting). Of that, approximately 44,729 acres of dog hunting area would be lost. Coordination between military activities and recreational activities occur in advance to eliminate potential interference and impacts from multiple land usage. Continued coordination of public land use with the military mission will also be enhanced through the implementation of the Public Access Map usage system. Furthermore, to minimize potential impacts to land use and recreation, several management requirements will be employed. These include maximizing mission activities in areas that are already permanently closed to the public, reporting violations

of any recreational rules to the appropriate authorities, and submitting a mission request in advance and having prior approval and scheduling before dispensing chaff.

Safety and Restricted Access (EA Section 3.6.2, pages 3-68 to 3-69) – The Air Force does not anticipate any adverse impacts to safety under the Proposed Action. Personnel would adhere to the safety standards and practices and qualification and training standards as outlined in the appropriate safety guidelines for each management activity.

Chemical Materials/Debris (EA Section 3.7.2, pages 3-72 to 3-81) – Chemical materials associated with wildfire support consist of fire retardants. There would be no significant impacts to air quality, aquatic or terrestrial wildlife, water resources, soils, or vegetation resulting from use of these substances. Retardant use on Eglin is rare, with the last documented occurrence in 1998. Potential impacts due to forest management and habitat restoration activities would be associated with herbicide use. However, there would be no significant impacts associated with herbicide use. Herbicides would be applied according to manufacturer directions, and management requirements would decrease the likelihood of adverse effects to water and biological resources. Conducted appropriately, herbicide use would likely have an overall positive effect by promoting species diversity and natural ecosystem processes due to non-native invasive vegetation control.

Cultural Resources (EA Section 3.8.2, pages 3-82 to 3-85) – Any management activity that involves ground-disturbing activities or fire has the potential to adversely affect existing or unexpected discoveries of cultural resources in a number of ways, thus all activities must be coordinated through the Eglin Cultural Resources Section (96 CEG/CEVSH). If ground-disturbing activities are planned, the 96th Civil Engineer Group/Environmental Management Division (96 CEG/CEV) must review project information. In addition to the initial Environmental Impact Analysis Process (EIAP) Air Force Form (AF Form) 813 review, 96 CEG/CEV reviews all digging permits (AF Form 103) and must sign off on the permit prior to commencement of the ground-disturbing activity per the *Eglin AFB Integrated Cultural Resources Management Plan*, dated September 2006. In the case of unexpected discoveries occurring during any management activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and 96 CEG/CEVSH will be contacted.

Socioeconomics (EA Section 3.9.2, pages 3-90 to 3-91) – Under the Proposed Action, management actions that increase the timber yield and recreational areas are anticipated to increase revenue, which would be used to fund up to an additional six new positions. These positions are anticipated to be filled by persons within the local community and would have no impact on population. However, if all positions were filled by persons outside the region of influence, the change in population and associated socioeconomics resources would be negligible. In addition, forestry activities would continue to support sustainable forest management practices that are both ecologically and economically sound while supporting the military mission. An increase in timber sales is anticipated from continued and additional timber management activities that would provide benefits to socioeconomic resources through increased value to the area and continued support for the military mission of the Eglin Complex, which is the major economic driver in the region. Additional revenue generated from an increase in timber sale products would ensure enough funding to support the necessary staff and ensure continued self-sufficiency of Eglin AFB programs and management requirements. Also, in the

event of an emergency, additional fire-suppression support associated with the Proposed Action during a wildfire response could be a significant benefit to the community and socioeconomic resources.

REGULATIONS, PLANS, AND PERMITS (EA Section 5.1, pages 5-1 to 5-5)

There are a number of applicable laws and regulations that NRS must adhere to and consider prior to and during all management activities included in the Proposed Action. Table 1 lists the laws and regulations and displays management activities to which each law/regulation is specifically applicable.

Table 1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations

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Laws/Regulations	Overall Natural Resources Program																	
	Climate Change	Wetlands	Biodiversity Mgmt.	Floodplains	Coastal and Marine Resources	T&E Species Mgmt.	Fire Mgmt.	Fish and Wildlife Mgmt.	Forest Mgmt.	Outdoor Rec. Mgmt.	Land Mgmt.	Public Relations	Budgeting	Mgmt. Training and Research & Development	Planning	Fish and Wildlife Enforcement	Aquatics and H2O Mgmt.	
Federal Wildland Fire Management Policy							X											
The Gonzolas Amendment, 10 U.S.C Section 2465							X											
AFI 32-7064 and DoDI 6055 direct wildland fire personnel to meet National Wildfire Coordinating Group Standards for training and physical fitness							X											
460 (I) Outdoor Recreation on Federal Lands 16 U.S.C. Section 460 (1)								X		X							X	
EO 11989, Off-Road Vehicle Use policy on federal land										X								
The Marine Mammal Protection Act (MMPA), 16 U.S.C. Section 1361 et seq.						X												
Coastal Zone Management Act (CZMA) of 1972 16 U.S.C. Section 1451 et seq.						X												
Coastal Barrier Resources Act (CBRA), 16 U.S.C. Section 3501 et seq.						X												
The Estuary Protection Act, 16 U.S.C. Section 1221 et seq.						X											X	
The National Marines Sanctuaries Act, 16 U.S.C. 1431 et seq.						X												
EO 13089, Coral Reef Protection						X												
“The Magnuson-Stevens Fishery Conservation and Management Act”						X											X	
The Clean Air Act							X											
The Sikes Act, 16 U.S.C. 670 (a)-(f) et seq.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
The National Environmental Policy Act (NEPA)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
DoDI 4715.03, Natural Resources Conservation Program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
AFI 32-7064, Integrated Natural Resources Management		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
The Endangered Species Act (ESA), 16 U.S.C. Section 1531 et seq.	X					X	X	X	X		X	X	X					

Table 1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations, Cont'd

Laws/Regulations	Overall Natural Resources Program																
	Climate Change	Wetlands	Biodiversity Mgmt.	Floodplains	Coastal and Marine Resources	T&E Species Mgmt.	Fire Mgmt.	Fish and Wildlife Mgmt.	Forest Mgmt.	Outdoor Rec. Mgmt.	Land Mgmt.	Public Relations	Budgeting	Mgmt. Training and Research & Development	Planning	Fish and Wildlife Enforcement	Aquatics and H2O Mgmt.
EO 11990, Protection of Wetlands		X															X
EO 11988, Floodplains Management				X													
The Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. Section 661								X									
Migratory Bird Treaty Act, 16 U.S.C. Section 703 et seq.						X		X									
The Federal Noxious Weed Act, 7 U.S.C. Section 2801 et seq.											X						
Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990 / National Invasive Species Act of 1996, 16 U.S.C.											X						X
The Clean Water Act (CWA)		X		X					X								X
National Wildfire Coordinating Group (NWCG) Policies							X										
EO 13148, Green the Government through Leadership and Environmental Management			X			X					X				X	X	X

AFI = Air Force Instruction; CBRA = Coastal Barrier Resources Act; CZMA = Coastal Zone Management Act; CWA = Clean Water Act; DoDI = Department of Defense Instruction; EO = Executive Order; ESA = Endangered Species Act; FWCA = Fish and Wildlife Coordination Act; MMPA = Marine Mammal Protection Act; NEPA = National Environmental Policy Act; NWCG = National Wildfire Coordinating Group; T&E = threatened and endangered; U.S.C. = United States Code

The NRS must maintain certain permits for monitoring, burning, nuisance animal control, and other natural resource management activities (Table 2). These permits are updated annually or as required. Contractors conducting any activities on behalf of NRS (i.e., Okaloosa darter monitoring) are required to obtain the applicable permits.

Table 2. Required Permits for NRS Management Activities

	Permit*	Purpose	Permit Issuer
Air Force	Digging Permit (AF Form 103)	Authorizes ground disturbing activities involved in erosion control and other management activities.	96 CEG/CEV
Federal	<i>Migratory Bird Depredation Permit</i>	<i>Authorizes take, by lethal means, of certain migratory birds for the purpose of airport safety (BASH).</i>	USFWS
	Eastern Indigo Snake Permit	Permittee is authorized to capture, translocate, and release the Eastern Indigo snake in accordance with the <i>2008 Eastern Indigo Snake Programmatic Biological Assessment</i> .	
	Manatee Skull Permit	Permittee is authorized to curate the skull for display and educational purposes.	
	Bird Marking and Salvage Permit	Authorizes the capture and marking of red-cockaded woodpeckers and burrowing owls.	
	Endangered/Threatened Species Permit: ESA Section 10(a)(1)(A)	Authorizes the capture and banding of red-cockaded woodpeckers, inspection of nest cavities, drilling of artificial cavities, installation of restrictor plates, and the training of others in these techniques.	
	Eagle Depredation Permit	Authorizes the use of nonlethal harassment activities to discourage eagle presence near the airfields.	
	Eagle Nest Take Permit	Authorizes the take of an inactive eagle nest for purpose of airport safety (BASH).	USEPA
	National Pollutant Discharge Elimination System (NPDES)	As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.	
State	Wildlife Possession Permit	Authorizes keeping gopher tortoise at Jackson Guard.	FWC
	Steel Trap Permit	Authorizes the use of up to 50 padded-jaw steel traps to catch/remove destructive furbearers (mainly beavers).	
	Gun and Light Permit	Authorizes the use of a gun and light at night to take depredating feral hogs, coyotes, beavers, fox, and raccoons.	
	Alligator Trapping Permit	Authorizes the capture and holding or relocation of nuisance alligators, depending on size of the alligator.	
	Marine Turtle Permit	Authorizes nesting surveys, protection of nests with screens or cages, relocation of nests, night public hatchling releases, maintenance and display of preserved specimens, and stranding and salvage activities.	
	Wildlife Possession/Institutional Permit	Authorizes the possession of the carcass or parts thereof of a black bear for educational purposes.	
	Bird Banding Permit	Authorizes the capture and banding of red-cockaded woodpeckers.	
	Inactive Osprey/Bird Nest Removal Permit	Authorizes the removal of inactive osprey and migratory bird nests in support of the BASH program.	
	Open Burning Authorization	Authorizes the utilization of prescribed burning on the Eglin Reservation (issued on a daily basis).	
	License to Sell Or Exhibit Wildlife	Authorizes the keeping and exhibition of wildlife.	

AF Form = U.S. Air Force Form; BASH = Bird/Wildlife Aircraft Strike Hazard; ESA = Endangered Species Act; FWC = Florida Fish and Wildlife Conservation Commission; NPDES = National Pollutant Discharge Elimination System; USEPA = U.S. Environmental Protection Agency; USFWS = U.S. Fish and Wildlife Service; 96 CEG/CEV = 96th Civil Engineer Group/Environmental Management Division

* Contractors conducting any activities on behalf of the Eglin Natural Resources Section (i.e., Okaloosa darter monitoring) are required to obtain the applicable permits.

MANAGEMENT ACTIONS (EA Section 5.2, pages 5-6 to 5-15)

The proponent is responsible for implementation of the following management actions:

General Requirements (EA Section 5.2.1, page 5-6)

- Potentially disturbing management activities (i.e., forest management) will not be conducted within active red-cockaded woodpecker (RCW) clusters during the RCW nesting season.
- If an injured or dead protected species is found, NRS would contact the appropriate U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Florida Fish and Wildlife Conservation Commission (FWC) offices.
- Annual reports would be provided to the USFWS and NMFS as required per ESA Section 7 and Marine Mammal Protection Act (MMPA) consultations and permits.
- If a gopher tortoise, indigo snake, or black bear is spotted during management activities, vehicle operators would stop until the animal had moved to safety before resuming activity.
- 96 CEG/CEVSN and 96 CEG/CEVSH will coordinate work plans annually to avoid potential impacts to cultural resources areas.
- Two fiscal years in advance of a sale, forestry personnel from 96 CEG/CEVSN will provide the Cultural Resources section with maps of proposed timber sale tracts.
- Should archaeological materials be inadvertently discovered during any NRS activities, all actions in the immediate vicinity would cease and efforts would be taken to protect the find from further impact.
- Brief NRS personnel and contractors on requirements resulting from the INRMP EA and any other applicable consultations, including an unexploded ordnance (UXO) briefing.
- Brief mission and construction personnel on requirements from Section 7 consultations that are applicable to their activities, and conduct spot checks for compliance, as resources allow.

Prescribed Fire (EA Section 5.2.2, pages 5-6 to 5-8)

For Biologically Sensitive Areas:

- Fire crews will be briefed on protection of biologically sensitive areas prior to and during the fire season.
- Plows will not be used off of range roads for fire line construction in Biologically Sensitive Areas unless approved by the Fire Manager.
- Construct firelines only where necessary, making use of existing barriers such as roads, water bodies, etc.
- Where possible, use alternatives to plowed lines such as harrowing, foam lines, wet lines or permanent grass.
- Do not plow lines through sensitive areas such as wetlands, marshes, prairies and savannas unless absolutely necessary. Avoid these areas or use alternative line construction methods.
- Maintain minimum plow depth at all times.
- When crossing water bodies, raise the equipment to prevent connecting the line directly to the water body.
- Do not construct firelines which act as drainage systems, particularly those that might connect or drain isolated wetlands.
- Avoid constructing plowed firelines in the Special Management Zone (SMZ), particularly the Primary Zone.
- Use water bars, turnouts and/or vegetation to stabilize firelines when erosion and sedimentation might otherwise result.
- When re-vegetating firelines, use native species when possible.
- Orient firelines along the contour wherever possible to prevent erosion and gullying.
- Do not prescribe burn for site preparation purposes within the SMZ when the slope of the site is 18 percent or greater (Site Sensitivity Classes [SSCs] 5 and 6).

For the RCW:

- Prior to prescribed burns, prepare active RCW cavity trees and newly drilled artificial cavity trees in recruitment clusters by cutting fuels around the individual cavity trees out to a distance of approximately 5 meters using a Brown tree cutter, Positrack mower, or DR mower mounted behind an all-terrain vehicle, and then raking the clippings away from the trees with rakes.
- Post a RCW trained monitor on all prescribed burns that involve active clusters or recruitment clusters, except those within UXO restricted suppression areas
- For nighttime burns, prepare RCW cavity trees prior to fire and have trained RCW monitors present during the fire
- For prescribed burns within no and restricted suppression areas:

- When deemed necessary, extend pre-fire preparation out further from the tree or apply fire resistant foam or water on or around the tree prior to fire being set.
- Check all cavity trees immediately following the fire to assess damage and to determine the need for replacement cavities.
- Trained NRS staff would replace any cavity tree damaged to the point it is unsuitable for nesting or roosting within 72 hours with a box insert.
- Annually burn No Suppression areas at and around test areas A-77, A-78, A-79, B-7, and C-62.
- Use prescribed burning as the preferred method for site preparation and control of woody vegetation. Limit herbicide use to manual application according to BMPs only when fire cannot be used.

For the Flatwoods Salamander:

- Avoid tying fire lines into known flatwoods salamander breeding ponds and other seasonal ponds, and avoid plowing around these ponds.
- During prescribed burning or fire fighting operations, avoid using foam or water from tanks containing foam residue in or around seasonal ponds.
- For necessary firebreaks along the urban interface within wetland areas, NRS will follow requirements from the Gyrotrack Section 7 Consultation (2003), including:
 - Use a low ground pressure Positrack tracked vehicle for mowing.
 - Conduct work during dry periods.

Wildlife Support (EA Section 5.2.3, pages 5-8 to 5-9)

For Biologically Sensitive Areas:

- Fire crews will be briefed on protection of biologically sensitive areas prior to and during the fire season.
- Plows will not be used off of range roads for fire suppression except in extreme conditions and with approval from the Fire Manager. Skim existing roads and trails or burn out areas to contain fires first.
- If necessary to plow near Okaloosa darter streams, Gulf sturgeon critical habitat, or freshwater mussel habitat during emergency wildfire situations, submit an incident letter to the USFWS.
- Restore any hydrological modifications or erosion sources created by plow lines created during emergency situations in wetlands.

For the RCW:

- For wildfires within no and restricted suppression areas, check all cavity trees immediately following the fire to assess damage and to determine the need for replacement cavities.

- Replace any cavity tree damaged to the point it is unsuitable for nesting or roosting within 72 hours with a box insert.
- Hire four additional firefighter positions.

For Flatwoods Salamanders:

- To minimize the potential for wildfires, NRS will maintain a three-year burn rotation in the East Bay Flatwoods area.
- Brief fire crews on protection of flatwoods salamander habitat prior to and during the fire season.

For Fire Suppression Activities within Known and Potential Salamander Habitat:

- Plows will not be used off of range roads for fire suppression except in extreme conditions.
- Fire crews will avoid plowing for suppression unless absolutely necessary; block and burn methods are preferable.
- If fire plows or foam are used during extreme conditions, submit an incident letter to the USFWS and complete restoration activities in cooperation with the USFWS.

Forest Management (EA Section 5.2.4, pages 5-9 to 5-11)

Follow the *Silvicultural BMPs for Florida* (from the Florida Department of Agriculture, 2011) during forest management activities:

Skid Trails

- Locate skid trails along the contour whenever practical to promote re-vegetation and reduce soil erosion. If skidding must be done up or down the slope, the operator should skid uphill and avoid long, continuous skid trails.
- After skidding activities are complete, stabilize skid trails where necessary by installing water bars or similar structures at recommended intervals; seeding and fertilizing skid trails will accelerate stabilization on erodible soils and/or steep slopes.
- When skidding in muck or peat (organic) soils such as in swamps, bogs or similar wetlands, concentrate skidding to as few trails as possible; this will confine soil compaction to small areas.
- When skidding on mineral soils, such as in uplands, skidding should be dispersed so that soil compaction is minimal even in individual trails.
- Keep main skid trails out of all SMZs except to approach a designated crossing.
- Keep loading decks or landings out of all SMZs. In addition, keep all log bunching points out of the Primary Zone of the SMZ.

Slash Disposal

- Logging slash, such as tops and limbs, which are incidental to timber harvesting activities, may be left in place, as long as such material is not left in a water body.
- Remove logging slash from all water bodies including both intermittent and perennial streams, lakes and sinkholes.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes, sinkholes or similar water resource features.

Site Preparation and Planting

- Plan site preparation and planting procedures prior to timber harvesting activities.
- Select only the site preparation techniques that are necessary to establish seedlings and minimize vegetative competition - do not needlessly disturb the ground surface or expose the topsoil.
- Do not conduct mechanical site preparation within any part of the SMZ.
- Do not conduct intensive mechanical site preparation such as bedding, raking and windrowing in wetlands.
- When chopping, pull chopper perpendicular to a water body to orient soil indentations along the contour (not necessary if chopping is followed by bedding or if the water body is separated from the chopped area by windrows or a similar barrier to overland flow).
- Arrange windrows and soil beds parallel to a water body or wetland in order to provide a barrier to overland flow prevent concentration of runoff and reduce erosion.
- When using a blade to shear, push, or pile debris, keep the blade above the soil surface. This will minimize erosion and facilitate rapid site recovery and tree growth.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes or similar water resource features.
- Do not conduct site preparation burning within the SMZ where slopes are 18 percent or greater.
- Commercial contractors retained to harvest timber on the Eglin Reservation are monitored by NRS for site prep/tree removal regulatory and best management compliance.
- Stumping operations are allowed only in areas of proposed roads, facilities, and planned construction.
- After forest operations, unnecessary forest roads are closed.
- In pine plantations, single drum chopping is used whenever possible (instead of bedding and root-raking).
- Forestry activities within RCW foraging habitat will be conducted in accordance with the most current RCW Recovery Plan tree density requirements.
- Logging operations avoid active and inactive gopher tortoise burrows when using heavy equipment.

- Follow requirements from the USFWS *Eastern Indigo Snake Programmatic Biological Opinion (BO)* (2009), including provide educational materials on the indigo snake to contractors.
- NRS will apply the USFWS *Recommended Timber Management Practices for the Flatwoods Salamander* (1999) (Table 3).

Table 3. Recommended Timber Management Practices for the Flatwoods Salamander

Primary Zone	Secondary Zone
538 feet from pond edge	538 to 1476 feet from pond edge
Selective harvest only	Mix of clear-cutting and selective harvest; clear cut up to 25 percent at any given time, maintain 75 percent of flatwoods habitat
Harvest only during dry periods	
Harvest at a minimum of 10-year intervals	
Maintain basal area at 45-50 square feet per acre	
Primary and secondary zones should not be separated by cleared or non-pine flatwoods habitat	
Locate skid trails so that wetland hydrology is not altered	
Locate log landings outside the primary and secondary zones	
Do not conduct intensive mechanical site preparation (root-raking, discing, stumping, bedding)	

Herbicide Application

Follow requirements in the *Long-term Vegetation Control (LVC) EA* and *Hexazinone Application on Interstitial Areas* consultation (2001 and 2007, respectively), including:

- All herbicide applicators used will be certified Florida herbicide applicators. New contracts will require herbicide applicators to be certified in the Florida Natural Areas Category.
- Herbicide labels and instructions would be adhered to during handling, mixing, and application of all herbicides.
- Sensitive habitat locations would be digitized using a global positioning system/geographic information system (GPS/GIS). The files would be provided to herbicide applicators to avoid the areas, unless application in such areas is specifically approved by the NRS.
- Coordination with an Eglin NRS endangered species biologist would be required prior to applying herbicides in sensitive areas.
- All contractors and their staff will be briefed on any potential endangered species concerns before conducting herbicide application activities in endangered species habitat.
- Herbicide applications for all non-aquatic labeled herbicides would not occur within 1,500 feet of confirmed and potential flatwoods salamander ponds, or within 300 feet of Okaloosa darter streams, Gulf sturgeon critical habitat, Florida bog frog streams, or gopher frog ponds.
- Restrict aerial application of non-aquatic label pesticides near aquatic sensitive habitats.
- Time the application of herbicides to avoid upcoming rain events.
- During the RCW nesting season (April to July), any treatments occurring within the boundaries of active RCW clusters would be hand crew application methods only.
- Site-specific natural or man-made drainage features, road corridors, or slopes with insufficient ground cover are not to be treated.

Habitat Restoration (EA Section 5.2.5, page 5-12)

Invasive Non-Native Plant Species Management

- Follow all Herbicide Use requirements from the Forest Management section above during invasive nonnative plant species (INPS) management activities.
- Herbicide applicators will be trained in the proper identification of invasive and native species.

Erosion Control and Fish Passage Restoration

- Follow the *Silvicultural BMPs for Florida* (from the Florida Department of Agriculture, 2011) during habitat restoration activities.
- Temporary silt fencing or hay bales would be installed during restoration activities.
- Native grasses and woody vegetation would be planted at the end of restoration activities, and maintained until the site is stabilized.

Nuisance and Non-native Animal Management and BASH (EA Section 5.2.6, page 5-12)

- All feral hogs that are taken would be euthanized.
- Feral cats captured on Santa Rosa Island (SRI) are live trapped and delivered to the Panhandle Animal Welfare Society (PAWS).
- Public outreach and education is conducted to improve understanding and tolerance regarding wildlife encounters. For example, Eglin base housing residents are provided with nuisance animal (black bear, snake and alligator) information.

Protected Species Management and Monitoring (EA Section 5.2.7, pages 5-12 to 5-14)

All Protected Species

- Only individuals who have been authorized by a section 10(a)(1)(A) permit issued by the USFWS (and when applicable, authorized by the FWC) for such activities, would be permitted to come in contact with or relocate a sea turtle, indigo snake, or other federally listed species.
- Brief construction and mission personnel regarding requirements from ESA and MMPA consultations (i.e., stop if a sea turtle, tortoise, indigo snake, etc. is spotted).

Indigo Snake

- Follow requirements from the USFWS *Eastern Indigo Snake Programmatic Biological Opinion (BO)* (2009). If it is necessary to relocate an indigo snake, then use the Indigo Snake Habitat Suitability and Relocation Models to determine the most appropriate location to release the snake. Snakes would only be held in captivity long enough to transport them to a release site, and only one snake to a container during transport.
- Distribute indigo snake signs to construction projects.

RCW

- During translocation associated activities, follow protocol as described in the revised RCW Recovery Plan and the Terms and Conditions in the Biological Opinion.
- For active clusters, mark 200-foot RCW buffers for training restrictions with GPS coordinates or existing GIS coverage, and update as changes occur within the clusters. Provide GPS data to training groups.

Sea Turtle Surveys

- Eglin AFB will implement their sea turtle nesting survey program in accordance with FWC permit requirements. Nest surveys would only be conducted by personnel with experience and training in nest survey procedures. Surveyors must be included on a valid State of Florida FWC permit.
- Nests deposited on Okaloosa Island/SRI must be marked and left in situ unless relocation is advised and in compliance with USFWS and FWC guidelines.

Sea Turtle Requirements for Management Activities (May 1 to October 31)

- Use only sea turtle compatible hand-held lights during sea turtle season.
- Personnel must operate vehicles at speeds less than 10 miles per hour (except in emergency situations).
- Vehicles must not have tire pressures greater than 10 pounds per square inch.
- Removal of all ruts seaward of nests expected to hatch within 10 days must be completed before sunset each day or until 3 days after first signs of hatchling emergence, or the nest has been washed out or destroyed whichever is earlier.
- No daytime (sunrise to sunset) beach driving by Eglin personnel shall occur on the Gulf beachfront before completion of daily sea turtle nest survey and protection measures.
- Do not drive vehicles on or across the dunes and vehicles must be driven seaward of the wrack or debris line (previous high tide) or just above it during high tide conditions.
- Headlights must be covered with the appropriate sea turtle filter material; if not feasible, vehicle headlights should be used at night only when the vehicle is moving.
- Personnel in vehicles on the beach must stop the vehicle, shut off the engine, switch from headlights to parking lights if at night (if applicable), and remain stationary (inside or on a vehicle if possible) until the adult female turtle completes nesting and returns to the sea or a hatchling(s) emerges from the nest and enters the sea.
- Any dune restoration must be designed and conducted to minimize impacts to sea turtles in accordance with Florida Department of Environmental Protection guidelines.
- Eglin must ensure Gulf County maintains compliance of the real estate lease which outlines the restrictions for beach driving on Cape San Blas (CSB).

Flatwoods Salamander Hardwood Control

- For hardwood control in flatwoods salamander ponds, apply herbicide with a sprayer to stumps using a U.S. Environmental Protection Agency-approved and Florida Department of Agriculture and Consumer Services-approved herbicide for aquatic environments (e.g., Garlon 3A) immediately after cutting the plants. Apply in accordance with label instructions.
- Any refueling or lubricating of equipment shall be done at least 150 feet from the edge of the water in the pond.
- Cut plants will either be scattered in the uplands adjacent to the wetland in piles up to 5 feet above ground level, or scattered throughout the wetland, avoiding piles.
- All work must be completed outside of breeding season (October to December).

Recreation Management (EA Section 5.2.8, pages 5-14 to 5-15)

At SRI:

- Requirements in the Sea Turtle Requirements for Management Activities section above also apply to Eglin Range Patrol activities.
- Post the exclusion areas and official beach access points on the public use portion of SRI, including information on the hours that beaches are closed to activities (sunset to sunrise). Post Cladonia areas and piping plover critical habitat.
- Work with Okaloosa County Sheriff's Office to ensure patrols of the public access portion of Eglin SRI property avoid sensitive areas and that they follow appropriate methods for driving on the beach.

At CSB:

- Requirements in the Sea Turtle Requirements for Management Activities section above also apply to Eglin Range Patrol activities.
- Eglin must ensure Gulf County maintains compliance of the real-estate lease, which outlines the restrictions for beach driving on CSB, including:
 - Prohibiting driving on Air Force beaches from sunset until 9:00 AM from May 1 to November 1 and enforcing such prohibition.
 - Posting beach signs and removing ruts caused by beach driving.
- Post the exclusion areas and official beach access points at CSB, including information on the hours that beaches are closed to activities (sunset to sunrise).
- Maintain gates to restrict vehicle access to Eglin beaches from sundown to sunup during sea turtle season (May 1 through October 31), and institute a rut removal program.

On Eglin Mainland:

- Gates and cables will be used to restrict access to prevent unauthorized vehicles from using the fuel break along the urban interface south of the East Bay flatwoods as a road. The boundary will be monitored for unauthorized vehicle use and illegal dumping.

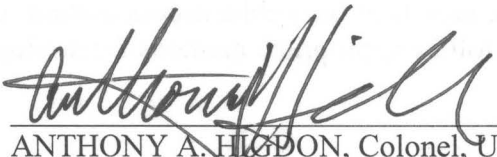
- As problem areas for off-road driving are identified, the NRS will implement restricted access controls sensitive habitats.
- During the Youth Fishing Rodeo, NRS personnel would be present at the rodeo to keep participants out of sensitive areas.

PUBLIC NOTIFICATION

A public notice was published in *The Daily News* on 26 November 2012, inviting the public to review and comment on the Draft-Final EA and Draft Finding of No Significant Impact. The public comment period closed on 28 December 2012, and no public comments were received. State agency comments were received and have been addressed in Appendix E, *Public and Agency Outreach*, of the Final EA.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and the environmental analysis contained in the attached EA, and as summarized above, I find that the proposed decision of the Air Force to implement the INRMP 2012–2016 activities on Eglin AFB, Florida, under the Proposed Action will not have a significant impact on the human or natural environment; therefore, an environmental impact statement is not required. This analysis fulfills the requirements of the NEPA, the President's CEQ, and 32 CFR Part 989.


ANTHONY A. HIGDON, Colonel, USAF
Commander, 96th Civil Engineer Group

28 Jan 13
Date

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR
INTEGRATED NATURAL
RESOURCES MANAGEMENT PLAN
ACTIVITIES,
EGLIN AIR FORCE BASE, FLORIDA**

(RCS 11-211)

Prepared for:

**DEPARTMENT OF THE AIR FORCE
Eglin Air Force Base, Florida**

Prepared by:

**Science Applications International Corporation (SAIC)
1140 Eglin Parkway, Shalimar, FL 32579**

January 2013



PRINTED ON RECYCLED PAPER

TABLE OF CONTENTS

	<u>Page</u>
List of Figures.....	iii
List of Tables.....	iv
List of Acronyms, Abbreviations, and Symbols.....	v
1. PURPOSE AND NEED FOR ACTION.....	1-1
1.1 Introduction.....	1-1
1.2 Proposed Action.....	1-3
1.3 Scope of the Proposed Action.....	1-4
1.3.1 Prescribed Fire.....	1-7
1.3.2 Wildfire Support.....	1-7
1.3.3 Forest Management.....	1-7
1.3.4 Habitat Restoration.....	1-7
1.3.5 Nuisance and Non-native Animal Management and BASH.....	1-8
1.3.6 Ecological Monitoring.....	1-8
1.3.7 Protected Species Management and Monitoring.....	1-8
1.3.8 Recreation Management.....	1-9
1.4 Decision Description.....	1-9
1.5 Issues.....	1-9
1.5.1 Issues Eliminated from Detailed Analysis.....	1-10
1.5.2 Issues Studied in Detail.....	1-10
1.6 Federal Permits, Licenses, and Entitlements.....	1-13
1.7 Document Organization.....	1-14
2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES.....	2-1
2.1 Alternative Development.....	2-1
2.2 No Action Alternative.....	2-1
2.3 Proposed Action.....	2-1
2.3.1 Prescribed Fire.....	2-2
2.3.2 Wildfire Support.....	2-2
2.3.3 Forest Management.....	2-3
2.3.4 Habitat Restoration.....	2-4
2.3.5 Nuisance and Non-native Animal Management and BASH.....	2-4
2.3.6 Ecological Monitoring.....	2-4
2.3.7 Protected Species Management and Monitoring.....	2-5
2.3.8 Recreation Management.....	2-7
2.4 Management Requirements.....	2-8
2.5 Comparison of Alternatives.....	2-9
2.6 Preferred Alternative.....	2-9
3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....	3-1
3.1 Air Quality.....	3-1
3.1.1 Affected Environment.....	3-2
3.1.2 Environmental Consequences.....	3-5
3.2 Soils.....	3-17
3.2.1 Affected Environment.....	3-17
3.2.2 Environmental Consequences.....	3-19
3.3 Water Resources (Surface Waters, Wetlands, Floodplains).....	3-23
3.3.1 Affected Environment.....	3-24
3.3.2 Environmental Consequences.....	3-28
3.4 Biological Resources.....	3-32
3.4.1 Affected Environment.....	3-32
3.4.2 Environmental Consequences.....	3-41
3.5 Land Use.....	3-60
3.5.1 Affected Environment.....	3-60
3.5.2 Environmental Consequences.....	3-63

TABLE OF CONTENTS CONT'D

	<u>Page</u>
3.6 Safety and Restricted Access.....	3-64
3.6.1 Affected Environment	3-64
3.6.2 Environmental Consequences.....	3-68
3.7 Chemical Materials/Debris	3-69
3.7.1 Affected Environment	3-70
3.7.2 Environmental Consequences.....	3-72
3.8 Cultural Resources	3-81
3.8.1 Affected Environment	3-82
3.8.2 Environmental Consequences.....	3-82
3.9 Socioeconomics.....	3-86
3.9.1 Affected Environment	3-86
3.9.2 Environmental Consequences.....	3-90
4. CUMULATIVE IMPACTS AND IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES.....	4-1
4.1 Past, Present, and Reasonably Foreseeable Actions in the ROI	4-1
4.1.1 Past and Present Actions.....	4-1
4.1.2 Reasonably Foreseeable Future Actions.....	4-1
4.2 Irreversible and Irretrievable Commitment of Resources.....	4-4
5. PLANS, PERMITS, AND MANAGEMENT ACTIONS	5-1
5.1 Regulations, Plans, and Permits	5-1
5.2 Management Actions.....	5-6
5.2.1 General Requirements	5-6
5.2.2 Prescribed Fire.....	5-6
5.2.3 Wildfire Support.....	5-8
5.2.4 Forest Management	5-9
5.2.5 Habitat Restoration	5-12
5.2.6 Nuisance and Non-native Animal Management and BASH.....	5-12
5.2.7 Protected Species Management and Monitoring	5-12
5.2.8 Recreation Management	5-14
6. LIST OF PREPARERS	6-1
7. REFERENCES.....	7-1
APPENDIX A Air Quality	A-1
APPENDIX B Biological Resources.....	B-1
APPENDIX C Federal Agency Coastal Zone Management Act (CZMA) Consistency Determination	C-1
APPENDIX D Section 7 Consultation with U.S. Fish and Wildlife Service	D-1
APPENDIX E Public and Agency Outreach.....	E-1

LIST OF FIGURES

	<u>Page</u>
Figure 1-1. The Eglin Military Complex	1-2
Figure 1-2. Eglin Mainland Reservation and Santa Rosa Island	1-5
Figure 1-3. Location of Cape San Blas, Florida	1-6
Figure 3-1. Example of the Smoke Model Output.....	3-7
Figure 3-2. Example of the Prescribed Fire Prioritization Mod//881	3-8
Figure 3-3. Soil Types of Eglin AFB.....	3-18
Figure 3-4. Ecological Associations at Eglin AFB.....	3-33
Figure 3-5. Sensitive Habitats at Eglin AFB	3-35
Figure 3-6. Sensitive Species on Eglin Mainland (East)	3-37
Figure 3-7. Sensitive Species on Eglin Mainland (West)	3-38
Figure 3-8. Sensitive Species at SRI.....	3-39
Figure 3-9. Sensitive Species at CSB	3-40
Figure 3-10. Eglin Core Conservation Area	3-42
Figure 3-11. Limited Suppression Areas	3-44
Figure 3-12. Priority Areas for Forest Restoration Timber Sales	3-50
Figure 3-13. Recreation Areas of the Eglin Reservation	3-62
Figure 3-14. ERP Sites on Eglin AFB (West)	3-73
Figure 3-15. ERP Sites on Eglin AFB (Central).....	3-74
Figure 3-16. ERP Sites on Eglin AFB (East).....	3-75
Figure 3-17. Cultural Probability Areas	3-83
Figure 3-18. FY01 – FY10 Timber Sale Revenue	3-87
Figure 3-19. FY00-10 Annual Permit Sale Revenue	3-89
Figure 3-20. FY00-10 Total Permits Issued	3-89

LIST OF TABLES

	<u>Page</u>
Table 1-1. INRMP Activities and Associated Component Plans	1-3
Table 2-1. Annual Average Prescribed Fire and Wildfire Numbers and Size	2-3
Table 2-2. Forest Management	2-3
Table 2-3. Habitat Restoration.....	2-4
Table 2-4. Nuisance and Non-Native Animal Management and BASH.....	2-4
Table 2-5. Ecological Monitoring.....	2-5
Table 2-6. Protected Species Management and Monitoring	2-5
Table 2-7. Recreation Management.....	2-8
Table 2-8. Summary Matrix of Issues, Proposed Action and Alternatives, and Potential Impacts	2-10
Table 3-1. National Ambient Air Quality Standards	3-2
Table 3-2. Baseline Emissions Inventory for Santa Rosa, Okaloosa, and Walton Counties	3-4
Table 3-3. Greenhouse Gas Inventory Totals	3-5
Table 3-4. Proposed Action - Criteria Pollutant Emissions from Prescribed Fires Compared to the County Emissions	3-6
Table 3-5. Proposed Action - Fire Emissions Compared to the Federal National Ambient Air Quality Standards (NAAQS).....	3-6
Table 3-6. Proposed Action - Annual Greenhouse Gases from Prescribed Fire Emissions under the Proposed Action	3-9
Table 3-7. Proposed Action - Emissions of Criteria Pollutants from Prescribed Fire Support Equipment	3-10
Table 3-8. Proposed Action - Air Emissions from Equipment Use in Support of Prescribed Fires Compared to the Federal National Ambient Air Quality Standards (NAAQS)	3-11
Table 3-9. Proposed Action - Annual Greenhouse Gas Emissions from Equipment Used in Support of Prescribed Burns	3-11
Table 3-10. Proposed Action - Criteria Pollutant Emissions from Wildfires	3-12
Table 3-11. Annual Greenhouse Gases from Wildfire Under the Proposed Action	3-12
Table 3-12. Proposed Action - Criteria Pollutant Emissions from Wildfire Support Equipment	3-13
Table 3-13. Proposed Action - Greenhouse Gas Emissions from Equipment Used During Wildfires.....	3-13
Table 3-14. Proposed Action - Criteria Pollutant Emissions from Forest Management Activities Compared to the County Emissions.....	3-13
Table 3-15. Proposed Action - Air Emissions from Equipment Use in Support of Forest Management Activities Compared to the Federal National Ambient Air Quality Standards (NAAQS)	3-14
Table 3-16. Proposed Action - Greenhouse Gas Emissions from Equipment Used During Forest Management Activities.....	3-14
Table 3-17. No Action Alternative - Criteria Pollutant Emissions from Prescribed Burning Compared to the County Emissions.....	3-15
Table 3-18. Annual Greenhouse Gases from Prescribed Fire under the No Action Alternative	3-15
Table 3-19. Emissions of Criteria Pollutants from Prescribed Fire Support Equipment Compared to the County Emissions.....	3-16
Table 3-20. No Action Alternative - Greenhouse Gas Emissions from Equipment Used During Prescribed Burns	3-16
Table 3-21. Soil Types and Characteristics Represented on Eglin AFB	3-19
Table 3-22. Focal Sensitive Species at Eglin AFB	3-36
Table 3-23. No Suppression, Restricted Suppression, and Biologically Sensitive Areas	3-45
Table 3-24. Herbicides Potentially Used on Eglin Air Force Base.....	3-70
Table 3-25. Types of Recreational Public Use Permits on the Eglin Reservation	3-88
Table 5-1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations.....	5-2
Table 5-2. Required Permits for NRS Management Activities.....	5-5
Table 5-3. Recommended Timber Management Practices for the Flatwoods Salamander	5-11

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

2,4-D	2,4-dichlorophenoxyacetic acid
96 CEG/CEVSH	96th Civil Engineer Group, Cultural Resources Section
96 CEG/CEVSN	96th Civil Engineer Group, Environmental Division, Natural Resources Section
96 CEG/CEVSNP	96th Civil Engineer Group, Environmental Management Division, Natural Resources Section – Fire Element
96 TW	96th Test Wing
ac	acre
AAC	Air Armament Center
ACE	Army Corps of Engineers
AF	Air Force
AFB	Air Force Base
AFF	Air Force Form
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFOSH	Air Force Occupational Safety and Health
AFR	Air Force Regulation
AFSOC	Air Force Special Operations Command
AGL	above ground level
AGOS	Air/Ground Operations School
ATV	all-terrain vehicle
BA	Biological Assessment
BASH	bird/wildlife aircraft strike hazard
BCP	Base Comprehensive Plan
BMP	best management practice
BO	Biological Opinion
C	Celsius
C4ISR	Command, Control, Communications, Computers, Intelligence, and Surveillance/Reconnaissance Systems
CAA	Clean Air Act
CATEX	categorical exclusion
CEQ	Council of Environmental Quality
CEVSN	Natural Resources Section
CFR	Code of Federal Regulations
CG	Coast Guard
CH₄	methane
CO	carbon monoxide
CO₂	carbon dioxide
CO₂e	carbon dioxide equivalent
CSB	Cape San Blas
CWA	Clean Water Act
CY	calendar year
CZMA	Coastal Zone Management Act
DASH	deer aircraft strike hazard
dbh	diameter breast height
DFC	desired future condition
DNA	deoxyribonucleic acid
DoD	Department of Defense
DoDI	DoD Instruction
DOF	Division of Forestry
DOI	Department of the Interior
DZ	drop zone
EA	Environmental Assessment
EDC	Economic Development Council
EGTTR	Eglin Gulf Test and Training Range
EIAP	Environmental Impact Analysis Process

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPPC	Exotic Pest Control Counsel
ESA	Endangered Species Act
EWTA	Eglin Water Test Area
F	Fahrenheit
FA	Floridan aquifer
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FE	federally endangered
FMZ	fire management zone
FNAI	Florida Natural Areas Inventory
FONPA	Finding of No Practical Alternative
FT	federally threatened
FTA	Florida Trail Association
FWC	Florida Fish and Wildlife Conservation Commission
FY	fiscal year
GHG	greenhouse gas
GIS	geographic information system
GOM	Gulf of Mexico
GPS	Global Positioning System
ha	hectare
HFC	hydrofluorocarbon
HLZ	helicopter landing zone
HQNA	high quality natural area
IEP	invasive exotic plant
INPS	invasive non-native plant species
INRMP	Integrated Natural Resources Management Plan
IS	intermediate system
JG	Jackson Guard
LCAC	landing craft, air cushion
LOE	level of effort
LVC	long-term vegetation control
LZ	landing zone
µg/m³	micrograms per cubic meter
MEA	management emphasis area
MEL	most efficient level
mg/L	milligrams per liter
mg/m³	micrograms per cubic meter
m	meters
mi²	square miles
MMPA	Marine Animal Protection Act
MMS	Minerals Management Service
MOU	Memorandum of Understanding
MSL	mean sea level
MU	management unit
my	man-year
N₂O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

NO₂	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRMP	Natural Resources Management Plan
NRS	Natural Resource Section
NWCG	National Wildfire Coordination Group
NWFMCG	National Wildland Fire Management Coordinating Group
NWFWMD	Northwest Florida Water Management District
NWI	National Wetlands Inventory
O₃	ozone
OAC	Outdoor Activities Committee
OSHA	Occupational Safety and Health Administration
OSS	Operational Support Squadron
PAM	public access map
PEA	Programmatic Environmental Assessment
PBG	potential breeding group
PFC	perfluorocarbon
pH	measurement of the basic or acid condition of a liquid
PM	particulate matter
PM₁₀	10-micrometer particulate matter
PM_{2.5}	2.5-micrometer particulate matter
POC	point of contact
POL	petroleum, oil, and lubricant
PPE	personal protective equipment
ppb	parts per billion
ppm	parts per million
ppt	parts per trillion
psi	pounds per square inch
RBA	reimbursable billing account
RCW	red-cockaded woodpecker
RIFA	red imported fire ant
ROCC	Range Operations and Control Center
ROI	region of influence
SA	surficial aquifer
SAIA	Sikes Act Improvement Amendments
SAIC	Science Applications International Corporation
SE	state endangered
SF₆	sulfur hexafluoride
SFG	Special Forces Group
SFS	SubFloridan system
SHPO	State Historic Preservation Officer
SLAMS	State and Local Air Monitoring Station
SMZ	special management zone
SO₂	sulfur dioxide
SO_x	sulfur oxides
SRI	Santa Rosa Island
SSC	site sensitivity class
ST	state threatened
T&E	threatened and endangered
THI	temperature-humidity index
TMD	Theater Missile Defense
TSI	timber stand improvement
TTA	tactical training area
U.S.	United States
USC	United States Code

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	unexploded ordnance
VOC	volatile organic compound
WFMP	Wildland Fire Management Plan
WHO	World Health Organization

1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Eglin Military Complex, located in the panhandle of northwest Florida (Figure 1-1), is one of 19 component installations categorized as a Department of Defense (DoD) Major Range Test Facility Base. Eglin Air Force Base (AFB) is situated among four counties: Santa Rosa, Okaloosa, Walton, and Gulf. Eglin AFB's primary function is to support research, development, test, and evaluation of conventional weapons and electronic systems. It also provides support for individual and joint training of operational units. The Eglin Military Complex currently comprises four components, which do not include the cantonment or main base areas:

1. Test areas/sites
2. Interstitial areas (areas beyond and between the test areas)
3. Eglin Gulf Test and Training Range
4. Airspace (overland and water)

In July 2012, the Air Force Air Armament Center (AAC), which was responsible for the Eglin Military Complex and all its users, was redesignated and the Air Force Materiel Command (AFMC) realigned 12 centers to 5. Eglin's test mission became part of the Air Force Test Center (AFTC) headquartered at Edwards AFB, California. Eglin's 96th Air Base Wing was redesignated as the 96th Test Wing (96 TW), with the previous 46th Test Wing transitioning to the 96 TW. The 96 TW is commanded by Brigadier General David Harris and aligned under the AFTC. For Range operations, the 96 TW provides environmental analyses and necessary National Environmental Policy Act (NEPA) documentation to ensure compliance with U.S. Air Force policy and applicable federal, state, and local environmental laws and regulations.

In 1960, the Sikes Act (Public Law 86-797) mandated the use of military lands for wildlife conservation and public recreation, authorizing the general public to hunt and fish on military installations as long as these activities were consistent with the military mission. Although the Sikes Act required installations to prepare natural resource management plans, it did not require installations to implement them. In 1998, the National Defense Authorization Act was passed, which included the Sikes Act Improvement Amendments (SAIA). The SAIA required the commanders of each military installation in the United States under the jurisdiction of the Secretary of Defense to not only prepare integrated natural resources management plans (INRMPs) but implement them as well.



Figure 1-1. The Eglin Military Complex

1.2 PROPOSED ACTION

The Eglin AFB Natural Resources Section (NRS) (96 CEG/CEVSN) is currently updating its INRMP to guide the direction of natural resources management on Eglin's lands and in the waters beneath Eglin's over-water airspace during the next five years (2012 through 2016). The Eglin INRMP details planned natural resources management activities, including wildlife, fire, and forest management; the implementation of these activities is the Proposed Action for this EA. The Proposed Action will involve a continuation of certain management activities, and will also implement changes in some activities to address issues identified during the INRMP review and planning process. The INRMP is a programmatic document that provides an overview of the future direction of natural resources management on Eglin. A compilation of "component plans" provides site-specific actions and operational details for each NRS management program component (e.g., Wildland Fire, Forest Management, and Threatened and Endangered Species programs) in support of the main INRMP document. These component plans are an extension of the INRMP and, thus, are considered a part of the Proposed Action (Table 1-1).

Table 1-1. INRMP Activities and Associated Component Plans

INRMP Activity	Component Plans
Prescribed fire	Wildland Fire Management Plan
Wildfire support	
Forest management	Forest Management Component Plan
Habitat restoration	Erosion Control Component Plan Threatened and Endangered Species Component Plan
Nuisance and non-native animal management and BASH	Invasive Non-native Wildlife, Feral Animals, and Nuisance Native Wildlife Operational Plan
Ecological monitoring	Ecological Monitoring Component Plan
Protected species management and monitoring	Threatened and Endangered Species Component Plan
Recreation management	Outdoor Recreation Component Plan

BASH: bird/wildlife aircraft strike hazard; INRMP: Integrated Natural Resources Management Plan

The **purpose and need of the Proposed Action** is twofold:

1. Purpose: to quickly and efficiently process modifications in natural resources management activities.
Need: to provide managers a quick response to new priority needs, as well as maintain the current approval process for routine activities.
2. Purpose: to update the NEPA analysis by re-evaluating natural resources management activities and by performing a cumulative environmental analysis of all management activities.
Need: the need associated with this item is multifaceted and is described below.

Eglin AFB previously performed environmental analysis of natural resources management activities in the *INRMP Final Environmental Assessment* (EA) (U.S. Air Force, 2002). Some of Eglin AFB's natural resources and activities have changed since the original environmental analysis was done, requiring new environmental analysis to be performed. Currently, when

approval for a new activity is requested, it may be categorically excluded from additional environmental analysis if it is similar to an activity that has been previously assessed and the assessment resulted in a finding of no significant environmental impact. The categorical exclusion (CATEX) designation is in accordance with NEPA and Air Force regulations (Council on Environmental Quality 32 Code of Federal Regulations 989.13 and Air Force Instruction [AFI] 32-7061).

Since some of these ongoing management activities were originally assessed, and also since some of the management activities used for CATEX purposes were assessed, changes have occurred at Eglin AFB that could affect environmental analyses. The types of changes resulting in the need to re-evaluate the NEPA analysis individually and cumulatively include the following:

- Additional species have been given federal and state protected status.
- Critical habitat for federally listed species has been expanded.
- Species not previously known to exist at Eglin AFB have been discovered.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased.
- Air Force regulations have changed.
- Military missions and natural resources management activities have evolved.

Natural resources management has been broadly identified as the *effector* of environmental impacts, and Eglin AFB's environment has been identified as the *receptor*. Evaluation and quantification of this effector/receptor relationship is the scientific basis for the environmental analysis detailed in this EA. This analysis allows for a cumulative look at the impact on Eglin receptors from all natural resources management activities. By implementing an authorized level of activity, natural resources management activities will be streamlined and cumulative environmental impacts will be more fully considered.

1.3 SCOPE OF THE PROPOSED ACTION

The region of influence (ROI) for this analysis is mainland Eglin, Santa Rosa Island (SRI) (Figure 1-2), and Cape San Blas (CSB) (Figure 1-3). Current land use within the ROI consists of military mission activities, natural and cultural resource management, and public use. The interstitial area of Eglin (areas outside of cantonment and test areas) is where the majority of natural resources management activities occur.

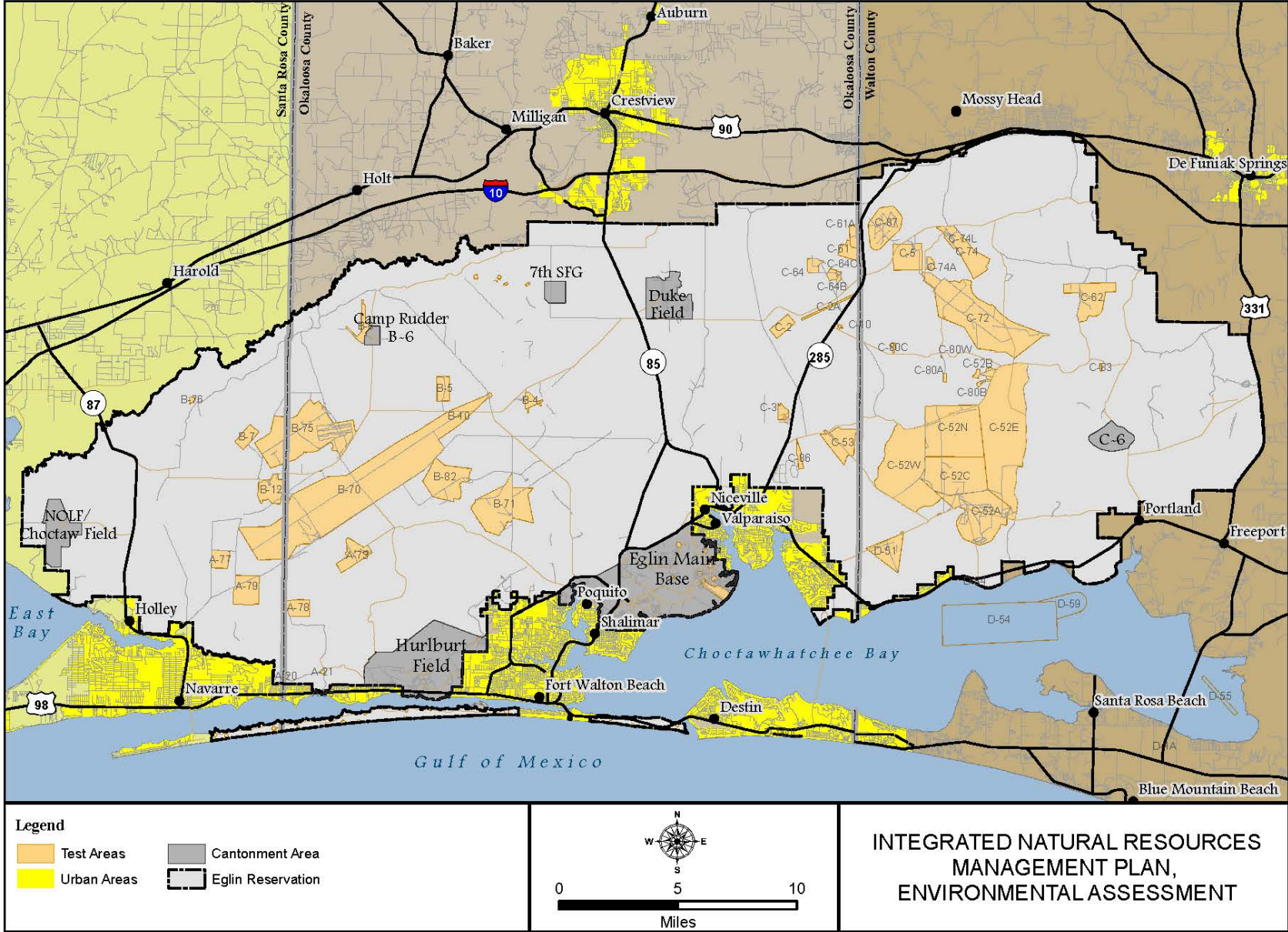


Figure 1-2. Eglin Mainland Reservation and Santa Rosa Island

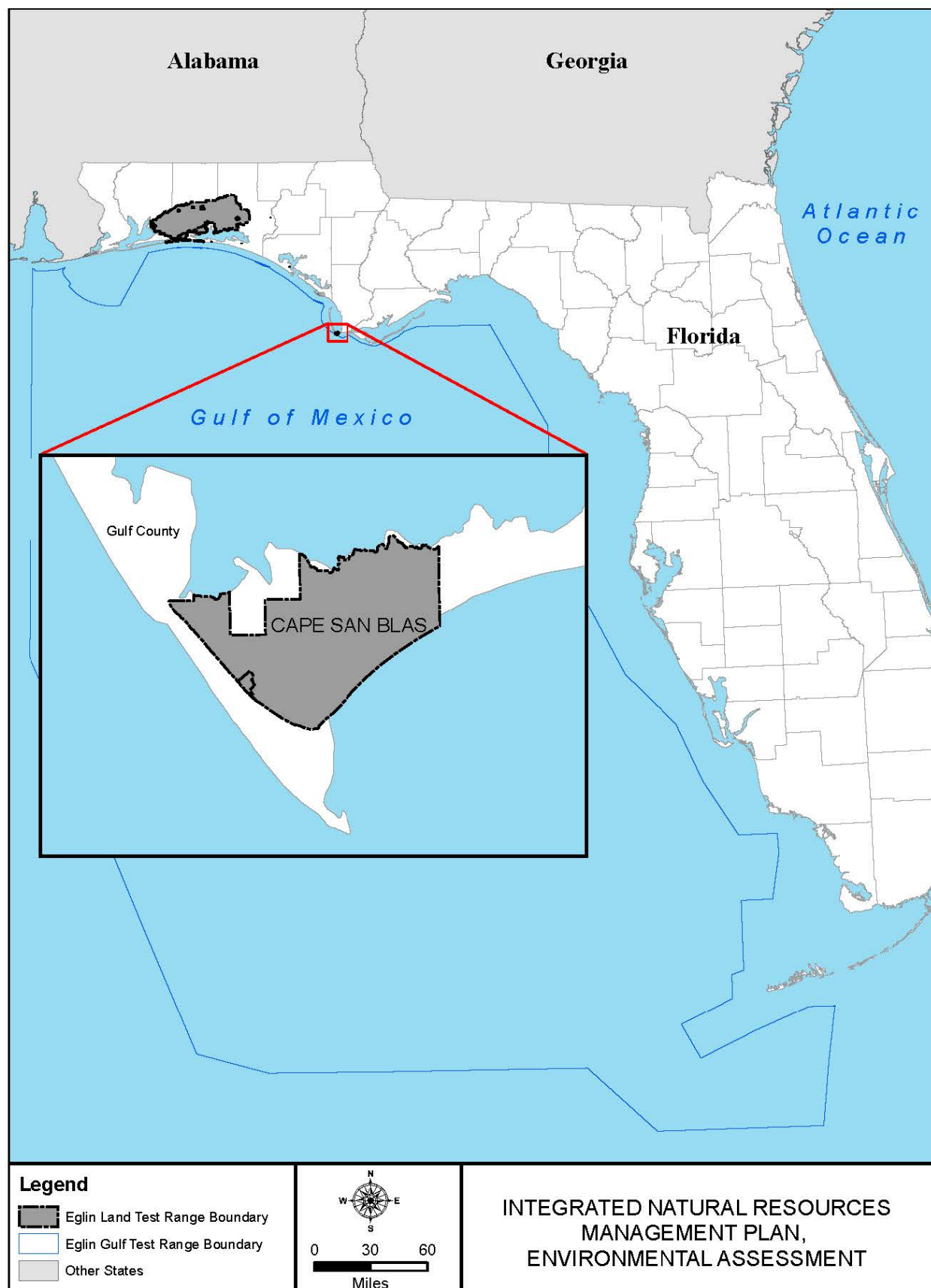


Figure 1-3. Location of Cape San Blas, Florida

1.3.1 Prescribed Fire

Eglin burns approximately 90,000 acres annually to support its globally significant, fire-dependent ecosystems. Aerial ignition is used whenever possible because it improves smoke management by allowing early completion of burns and better smoke dispersion. NRS also conducts occasional night-time prescribed burning. All-terrain vehicle (ATV) mounted, pickup-mounted and hand-held torches are used as needed to assist and supplement aerial ignition. A geographic information system (GIS)-based management prioritization system synthesizes multiple data layers including fire history, ecosystem health information (based on remote sensing and ground surveys), mission requirements, presence of rare, fire-dependent species, management objectives, smoke management constraints and forest management activities. The output is a prioritized landscape management map that guides day-to-day activities on the ground, as well as short-term and long range planning efforts.

1.3.2 Wildfire Support

The Wildfire program includes all aspects of fire prevention, detection, suppression, readiness, fire line rehabilitation, and training. Both wildfire occurrence (over 100 wildfires per year) and associated risk are high for Eglin. As populations increase around Eglin's borders, risks of negative impacts to the public from wildfires and their smoke also increases. Air Force structures and equipment are also at risk from wildfire damage and smoke can negatively impact visibility-sensitive missions. Wildfire suppression typically involves the use of heavy equipment (dozers) plowing fire lines or use of drip torches to burn out areas in advance of the fire to contain it. Crews may also clear debris from existing roads and firebreaks or use water tankers to control the fire within a burn block. The majority of wildfires on Eglin are caused by missions.

1.3.3 Forest Management

Forest Management conducts timber removal, site preparation, reforestation, and native understory restoration to promote endangered species recovery and biodiversity. Activities conducted by Forest Management include removal of sand pine that has invaded longleaf pine sandhills, conversion of off-site slash pine and sand pine plantations to longleaf pine, salvage of damaged timber, and timber removal for construction. Reforestation activities include promoting natural regeneration of longleaf pine, planting longleaf pine seedlings, and using chemical and mechanical methods for habitat/timber stand improvement (TSI) and site preparation. Eglin's Forest Management also harvests and plants native grass seed for groundcover restoration and erosion site stabilization. Eglin follows the *Silviculture Best Management Practices* published by the Florida Department of Agriculture and Consumer Services to minimize impacts to the environment from forest restoration activities.

1.3.4 Habitat Restoration

For the purposes of this EA, habitat restoration will include erosion control, fish passage restoration, and invasive non-native plant species (INPS) control; prescribed fire and forest management are discussed separately. Erosion control and fish passage restoration projects are focused in watersheds of the federally listed Okaloosa darter and Gulf sturgeon and those with Clean Water Act issues. Erosion control projects focus mainly on the rehabilitation of borrow pits and other erosion sites within riparian areas through culvert removal, earth-moving, berm

construction, and revegetation. Fish passage projects involve removal of culverts, floodplain re-establishment, and vegetation planting. Site maintenance continues at all erosion sites until they are stabilized.

INPS control involves identifying problem areas, mapping locations, and applying control techniques, including but not limited to herbicide treatment, mowing, disking, hand-pulling, and prescribed fire. Efforts focus on areas with sensitive species and habitats, with the majority of problem areas located along the urban interface.

1.3.5 Nuisance and Non-native Animal Management and BASH

Non-native animal control efforts center on feral hogs on the mainland reservation and feral cats, coyotes, and red foxes on SRI and CSB. Sensitive areas where hog damage has been found are prioritized for hog trapping. The NRS sponsors the U.S. Department of Agriculture (USDA) to control non-native predators and unnaturally high densities of native predators (coyotes, red fox, and raccoons) on SRI and CSB, which reduces impacts to sea turtles, beach mice, and other sensitive beach species.

Eglin NRS is the lead agency responsible for responding to nuisance and injured wildlife through the following options: 1) not intervening, 2) capturing and immobilizing, 3) taking to the Emerald Coast Wildlife Refuge or a local vet for treatment or rehabilitation, or 4) euthanizing. The NRS will continue to provide BASH support and assistance to USDA personnel for bird and wildlife harassment, lethal control activities, and other projects such as vulture roost monitoring, effigy placement, and migratory bird nest removal.

1.3.6 Ecological Monitoring

The mission of the Ecological Monitoring Program is to enhance military mission flexibility and success by supporting the Eglin AFB NRS adaptive management efforts through statistically sound, scientifically based monitoring of community conservation targets, including sandhills, flatwoods, steepheads, seepage slopes, and stream habitats. Ecological monitoring supports adaptive management by informing managers of community change resulting from management actions. If impacts are negative (e.g., loss or degradation of ecosystem function and processes), management practices can be altered. Alternatively, management actions that prove to have ecologically beneficial outcomes can be perpetuated. This iterative feedback loop, whereby monitoring can inform and affect management, is referred to as “adaptive management.”

1.3.7 Protected Species Management and Monitoring

To protect and recover threatened and endangered (T&E) species and migratory birds, the NRS conducts a variety of both species-specific and general habitat management and monitoring activities for 11 federally listed and selected state-listed species present on the Eglin Reservation. Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management activities that benefit T&E species are covered in those respective sections. Species-specific activities included in this section include population monitoring, hardwood control in flatwoods salamander habitat, and translocation/relocation of species.

Under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), Eglin must consult with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) on proposed actions that may affect federally listed T&E species or marine mammals, respectively. Within the Air Force, this initial determination is made as part of the Environmental Impact Analysis Review Process (EIAP), which involves many Eglin organizations, including the NRS, as active team members. The role of the NRS in the EIAP is to assess potential impacts of proposed mission activities to natural resources and determine measures to avoid or minimize impacts to protected species. As part of this process, the NRS may need to do a Section 7 consultation, MMPA consultation, or a Coastal Zone Management Act (CZMA) determination.

1.3.8 Recreation Management

The NRS strives to promote and develop sustainable recreational opportunities, which include hunting, fishing, and nonconsumptive uses, in a manner compatible with the military mission and subject to safety and security requirements. The state of Florida owns and has jurisdiction over resident fish and wildlife throughout the state, including Eglin AFB. As such, the Florida Fish and Wildlife Conservation Commission (FWC) establishes rules, regulations, and season dates governing the taking of resident fish and wildlife species. Nonconsumptive recreation includes canoeing, hiking, picnicking, nature study and appreciation, swimming, and bicycling. Due to inadequate conservation law enforcement, some of Eglin's natural resources are becoming degraded as a result of noncompliance with applicable laws and Eglin-specific rules and regulations.

1.4 DECISION DESCRIPTION

The NRS desires to authorize a new level of activity for Eglin natural resources management activities, replacing the current authorized level, as discussed in Chapter 2. A decision is to be made on the level of activity to be authorized, which includes changes in activity types, the combination of activities, and the level of intensity of activities. By authorizing a new level of activity and analyzing the effects of that level of activity, future similar actions may be categorically excluded from further environmental analysis. This will save both time and money in the review of proposed actions and will enable the NRS to more quickly and efficiently conduct management activities. Authorization of a new level of activity will streamline the environmental process, enhancing Eglin AFB's ability to quickly respond to high-priority or crisis requirements.

1.5 ISSUES

Specifically, an issue may be the result of a land use activity that may directly or indirectly impact physical, biological, and/or cultural environment resources. A *direct* impact is a distinguishable, evident link between an action and the potential impact, whereas an *indirect* impact may occur later in time and/or may result from a direct impact. Potential environmental impacts of alternative actions on Eglin resource areas were identified through preliminary investigation.

1.5.1 Issues Eliminated from Detailed Analysis

Environmental Justice

On 11 February 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued with the directive that during the NEPA process, federal agencies adopt strategies to address the environmental concerns of minority and low-income communities that may be impacted by the implementation of federal missions. The intent of the executive order is to ensure that no individual or community, regardless of race, ethnicity, or economic status, should shoulder a disproportionate share of adverse environmental impacts to human health or environmental condition resulting from the execution of federal activities. The purpose of environmental justice is to identify disproportionately high and adverse socioeconomic and/or environmental impacts and identify appropriate alternatives.

The executive order also requires the application of equal consideration for Native American programs. This may include the protection of Native American tribal lands and resources such as treaty-protected resources, cultural resources, and/or sacred sites. This issue, along with the associated public participation mechanisms, is fully addressed via the INRMP review process and Eglin's compliance with the following:

- Native American Graves and Repatriation Act of 1990
- American Indian Religious Freedom Act

Because of the broad scope of the Proposed Action, there are no low-income or minority individuals or communities or Native American resources, that are anticipated to be *disproportionately* impacted socioeconomically or environmentally by the changes to NRS's management program under the Proposed Action. The Proposed Action would affect the entire reservation, as well as all the surrounding communities. As a result, a further analysis of environmental justice was not included in this Environmental Assessment.

Noise

Noise levels directly associated with activities under the Proposed Action and No Action Alternative would be nominal. Activities associated with these actions would involve the use of heavy equipment for forestry and firefighting activities. These types of equipment are already in use, with changes in use related to the acreage and duration of equipment use. The noise generated from these activities would not significantly increase noise levels on the Eglin reservation or the surrounding community. As a result, noise was eliminated as an issue warranting further analysis. The impacts to noise generated from mission activities associated with forestry activities and subsequent thinning and/or removal of test area "noise buffer" areas will be addressed under military mission land use.

1.5.2 Issues Studied in Detail

The following issues were identified as having the potential for impacts (either positive or negative) under the Proposed Action and No Action Alternative and, therefore, requiring detailed

analysis. Unauthorized activities, such as off-road driving and nighttime beach activities, are not included in the analysis.

Air Quality

Natural resources management activities would release emissions into the air, primarily from prescribed burning activities. Emissions from equipment use would be intermittent, short-term, and temporary, and would not significantly contribute to the overall emissions inventories of Eglin AFB or the surrounding communities. Positive impacts would result from carbon sequestration by the forests managed by NRS. Analysis addresses the expected levels of emissions and compares these levels with what is currently permitted from all Eglin AFB sources and county emissions.

Soils

Ground-disturbing land management activities have the potential to accelerate erosion if proper erosion control measures are not in place or are not effective. Activities of concern include timber operations, site preparation activities, wildfire suppression, and prescribed burning. Erosion control projects and forest management activities temporarily expose soils, but best management practices (BMPs) are used and these activities result in long-term positive impacts when vegetation is re-established. Recreational activities, such as beach driving at CSB, may disturb soil. Feral hog control activities would also result in beneficial impacts through reduction of soil rooting.

Water Resources

Water resources within the ROI include surface waters (streams, ponds) and subsurface waters (the water table), wetlands, floodplains, and the coastal zone. Timber operations, site preparation activities, wildfire suppression, prescribed burning, and recreational activities have the potential to negatively affect water quality, wetlands, and floodplains, due to ground disturbance and associated excess sedimentation due to erosion. The use of herbicides could also negatively impact surface and ground water quality. Conversely, erosion control projects and tree planting would improve the condition of wetlands, floodplains, and water quality through sediment reduction and floodplain restoration. Feral hog control activities would also result in beneficial impacts through reduction of rooting in sensitive wetland habitats.

Biological Resources

Biological resources (plants and animals and related habitats) may be both positively and negatively affected by INRMP activities. The majority of INRMP activities are conducted to improve the condition of natural resources; however, some of these activities do have the potential for negative impacts to these same resources. Analysis focuses on the potential for actions to affect the quality of natural habitats on Eglin and harass or directly, physically affect protected species. Prescribed fire has a positive effect for habitat maintenance but may be a negative impact if red-cockaded woodpecker (RCW) trees/nestlings are killed or injured. Wildfire suppression in wetlands and streams can alter hydrology and cause excess sedimentation and may affect protected species within these habitats (i.e., flatwoods salamander, Okaloosa darter). Erosion control and floodplain restoration projects may temporarily cause

localized sedimentation but have long-term beneficial impacts. Forest management to restore native forests provides for long-term improvement of habitat, but there can be short-term negative impacts due to habitat reduction and possible erosion. Recreation management may negatively impact sensitive habitats and species, such as sea turtles and Okaloosa darters. Due to the potential for impacts to federally listed species, an ESA Section 7 consultation was initiated May 17, 2012, for the INRMP. On October 15, 2012, Eglin NRS received a letter of concurrence with Eglin's determination that management actions as implemented within the INRMP would either **not likely adversely affect** or have **no effect** on threatened and endangered species other than the RCW (Appendix D, Section 7 Consultation with U.S. Fish and Wildlife Service). The USFWS determined that prescribed fire activities are **likely to adversely affect** the RCW. The USFWS determined that it would be most efficient for both the USFWS and Eglin's NRS staff to initiate a programmatic biological opinion for all actions within Eglin's NRS purview. USFWS intends to finalize the programmatic biological opinion in 2013.

Land Use and Recreation

Land use generally refers to human management and use of land. Specific uses of land on Eglin include military, recreational, and residential, as well as areas for protection of natural resources. This EA focuses on INRMP resource management activities and their potential impacts to other land uses, primarily recreational and military.

Potential recreational issues associated with INRMP implementation include the opening or closing of areas to recreation, the price of recreation permits, the proportion of stalk/still hunting areas to dog hunting areas, the population status of various game animals, changes in the types and lengths of hunting seasons, and changes in the areas open to motorized vehicle use for recreation. Inadequate conservation law enforcement leaves natural resources vulnerable to damage, jeopardizes future outdoor recreation opportunities, and may subject Eglin to punitive action resulting from noncompliance with mandated conservation-related legislation and regulatory requirements.

Safety and Restricted Access

Safety involves hazards to military personnel, NRS personnel, and the public resulting from natural resources management activities. Unexploded ordnance (UXO) hazards during prescribed fire and wildfire activities have received increased attention due to recent incidents. *Restricted access* is a decrease in the availability of Eglin resources resulting from the temporary closure of test areas, interstitial/recreational areas, or public roads because of mission activities due to safety considerations. Receptors potentially impacted include the military, NRS personnel, and the public desiring to use these areas.

Portions of Eglin are closed to the public, but due to the easy accessibility of many of these areas, members of the public can and do enter closed areas. This unauthorized access can have effects on the mission as well as to natural resources. Additional issues include the potential increases in acreage susceptible to wildfire, the ability of NRS personnel to respond to wildfires, reductions in access for management due to mission closures, and prescribed burning issues involving smoke management concerns (public highways, airfields, and adjacent communities).

Chemical Materials

Chemical materials encompass liquid, solid, or gaseous substances released to the environment as a result of management activities. Issues related to chemical materials include the potential for negative impacts associated with the use and storage of herbicides; petroleum, oil and lubricants (POLs); and other chemicals. The environmental analysis of chemical materials describes the amounts, extent, and estimated concentrations of chemical materials produced by these activities with regard to potential impacts to vegetation, wildlife species, and surface water and sediment quality. The potential influences of the sediment and water environment and food chain on the availability and translocation of chemical contaminants are also evaluated.

Cultural Resources

Potential effects to cultural resources would include disturbance or destruction of historic structures, archaeological sites, and/or artifacts. Physical disturbance and/or the destruction of cultural resources could occur from recreation, prescribed burning, wildfire suppression, erosion control projects, and forest management activities. However, to minimize impacts, NRS coordinates with the Cultural Resources Section at least annually on natural resource management projects. The analysis will focus on the likelihood of site disturbance and/or destruction of cultural resources. The tribes are being given the opportunity to review and comment on the INRMP.

Socioeconomic Resources

INRMP implementation may affect the socioeconomics of the local communities surrounding Eglin, as well as affect the relationship Eglin AFB shares with the local community. Additionally, changes to NRS's management program would likely affect NRS financially. Potential issues targeted for analysis include quality of life for Air Force personnel and the community and availability of forest products for public use.

1.6 FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

AFI 32-7064, *Integrated Natural Resources Management*, implements Air Force Policy Directive 32-70 and DoD Instruction (DoDI) 4715.3. This instruction details how to manage natural resources on Air Force installations to comply with applicable federal, state, and local laws and regulations. The INRMP for Eglin AFB facilitates compliance with federal, state, and local environmental requirements. These requirements deal with analysis of potential environmental impacts; water and air quality; wetlands; endangered species, marine mammals, migratory birds, and other wildlife; forest and fire management; and public access and recreation.

An ESA Section 7 consultation with the USFWS has been initiated to analyze potential impacts resulting from NRS management activities and to determine avoidance and minimization measures (Appendix D). NRS is also required to coordinate annual work plans (i.e., fire, forestry, erosion control projects) with the Cultural Resources Section to minimize the potential for adverse impacts to cultural resources. The NRS maintains numerous permits for monitoring,

burning, nuisance animal control, and other natural resource management activities (see Table 5-2 in Chapter 5). These permits are updated annually or as required.

Some components of this action would take place within or otherwise may affect the jurisdictional concerns of the Florida Department of Environmental Protection (FDEP) and will, therefore, require a consistency determination with respect to Florida's Coastal Zone Management Plan under the federal Coastal Zone Management Act (Appendix C).

1.7 DOCUMENT ORGANIZATION

This EA contains seven chapters. Chapter 1 details the purpose and need for the action and also describes the location of the Proposed Action. It also summarizes the scope of the environmental review. Chapter 2 details the Proposed Action and the No Action Alternative. Chapter 3 describes, in general, the current conditions of the resources that the Proposed Action could affect and presents the analysis of the environmental consequences of the Proposed Action and the No Action Alternative. Chapter 4 provides an analysis of cumulative impacts and irretrievable commitment of resources. Chapter 5 identifies permitting requirements, mitigations, and management practices for minimizing potential impacts. Chapter 6 lists the preparers of this EA. Chapter 7 lists publications cited in this report.

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

As required by federal regulation, this EA addresses the possible environmental impacts of implementing the Proposed Action or continuing the No Action Alternative. It should be noted that the environmental stewardship of Eglin's natural resources and the sustainment and flexibility of Eglin's military mission are intertwined, with a shift in one directly affecting the other.

2.1 ALTERNATIVE DEVELOPMENT

The 2012-2016 INRMP update is the third major five-year update that the Eglin NRS has conducted (U.S. Air Force, 2002; U.S. Air Force, 2007). In the interceding years, the INRMP is generally updated on an annual basis or as needed in order to incorporate specific changes to management programs. Due to significant upcoming changes in the mission and the resulting impacts on natural resources management, this document is being prepared to analyze how future management will affect the environment and discuss measures to reduce negative impacts.

The Proposed Action has evolved over time through updates of the management activities and goals and objectives detailed in the INRMP. To ensure mission needs and legal requirements are addressed, the INRMP Proposed Action is coordinated with the Air Force major command, 96 TW, other CEG/CEV organizations, FWC, USFWS, and NMFS. Section 2.5 provides a summary of the issues and potential impacts associated with the Proposed Action and No Action Alternative (level of activity in the 2008 Annual INRMP Update).

2.2 NO ACTION ALTERNATIVE

The No Action Alternative would continue the natural resources management programs as laid out in the 2008 Annual INRMP Update (U.S. Air Force, 2009). All program components would maintain the baseline activities as described for each program in Section 1.2 and shown in Table 2-1 through Table 2-7 (the tables in Section 2.3), except in situations where mission activity or policy changes have resulted in changes to the baseline, independent of natural resources management. For example, the No Action Alternative would be required to follow the same restrictions as the Proposed Action in the No and Restricted Suppression areas due to the 2011 policy change (described in Section 2.3.1, Prescribed Fire). Additionally, the locations/acreages of areas open/closed to recreation and the number of predicted wildfires are the same for the No Action Alternative and the Proposed Action; baseline numbers were not used because these changes resulted from changes in mission activity, independent of natural resources management decisions.

2.3 PROPOSED ACTION

The Proposed Action would refocus the NRS program according to the five principal goals from the 2012-2016 INRMP:

1. Provide direct support and coordination services by planning for and adapting to a rapidly changing military mission.
2. Restore the longleaf pine ecosystem and recover threatened and endangered species in the Core Conservation Area.
3. Enable long-term sustainability of barrier island environments for military testing/training by protecting and maintaining threatened and endangered species and their habitats.
4. Restore, protect, and monitor wetland and aquatic habitats to comply with federal law and recover threatened and endangered species.
5. Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.

Below is a description of the changes in the NRS program components associated with the Proposed Action, as compared to the baseline outlined in Section 1.2. Unauthorized activities such as off-road driving and nighttime beach activities may also result in impacts. However, while these impacts may be mentioned, these actions are not part of the Proposed Action, thus, they are not included in the analysis.

2.3.1 Prescribed Fire

The annual prescribed fire acreage would increase slightly over the No Action, and helicopter use and night burning would also increase (Table 2-1). The NRS will continue to utilize the Fire Prioritization Model to determine high priority areas for burning. Heightened concern over UXO has recently increased restrictions on fire activities within high-probability areas for UXO (restricted suppression areas), limiting access to these areas during active fire and increasing the no and restricted suppression areas from a baseline of 10,000 acres to approximately 40,000 acres now. No monitors of RCW trees are allowed in these areas until after the fire is out.

2.3.2 Wildfire Support

The baseline of 110 wildfires totaling 7,000 acres was the average for 2006-2010 (U.S. Air Force, 2011a). An increase in fire-starting missions is anticipated to increase wildfire activity by 40 percent over the baseline, for an average of 154 wildfires totaling 17,000 acres annually (U.S. Air Force, 2012). Restrictions on fire activities within 40,000 acres of no and restricted suppression areas limit access to these areas during active fire and effectively increase the size of wildfires within these areas. The Proposed Action assumes the average wildfire size would remain the same (60 acres), except within the no and restricted suppression areas, where a 20 percent increase in the size of wildfires over the baseline is expected. The Proposed Action also assumes 8,000 additional wildfire acres within no and restricted suppression areas. The Proposed Action includes the assumption of increased manpower by hiring four additional firefighters to maintain adequate response time and fire containment.

Table 2-1. Annual Average Prescribed Fire and Wildfire Numbers and Size

	No Action	Proposed Action
Prescribed Fires		
Average acres annually	86,000	90,000
Average annual number	120	125
Average size (ac)	720	720
Night burns (#)	5	10
Helicopter use	Call-in contractor available	Exclusive use of helicopter
Wildfires		
Average acres annually	17,000	
Average annual number	154	
Average size (ac)	60	
Additional wildfire acres within no and restricted suppression areas	8,000	
Firefighters	No new positions	4 new positions
No Suppression and Restricted Suppression Areas		
No Suppression and Restricted Suppression Areas	40,000 acres of no and restricted suppression areas No monitors of RCW trees allowed until after fire complete. No plowing in UXO areas.	

ac = acre; RCW = red-cockaded woodpecker; UXO = unexploded ordnance.

2.3.3 Forest Management

Under the Proposed Action, forest management would continue to support sustainable forest management practices and protected species habitat restoration (Table 2-2). Updated priorities have shifted additional efforts to sand pine removal activities and planting/natural regeneration.

Table 2-2. Forest Management

Activity	No Action Acres (acres/year)	Proposed Action (acres/year)
Timber Management/Restoration		
Invasive Sand Pine Removal	3,000	3,000
Sand Pine Plantation Removal	500	500
Stunted Slash Pine Plantation Removal	1,500	800
Slash Pine Plantation Thinning/Conversion	325	325
Longleaf Pine Thinning	4,500	3,000
Sand Pine Seed Tree	500	500
Timber Stand Improvement		
Sand Pine Removal TSI (brush saw/chainsaw)	3,500	6,000
Herbicide (chemical) TSI	3,000	1,000
Reforestation		
Site Preparation	1,500	2,500
Planting and Natural Regeneration	1,500 (planting only)	4,000 (planting and natural regeneration)

TSI = timber stand improvement

2.3.4 Habitat Restoration

INPS control, erosion control, and fish passage restoration projects would continue under the Proposed Action (Table 2-3). Erosion control work would shift in focus from Okaloosa darter streams to Gulf sturgeon and Clean Water Act watersheds. There are fewer sites under the Proposed Action because there are fewer priority sites as NRS continues to restore sites.

Table 2-3. Habitat Restoration

Activity	No Action	Proposed Action
Erosion Control and Fish Passage Restoration		
T&E erosion control sites	25 sites/year	20 sites between 2012 and 2014
Fish passage restoration (number/5 years)	2	2
CWA erosion control sites (number/year)	5	5
Maintain all rehabilitated erosion sites for 3-5 years (number/year)	110	110
Invasive Non-native Plant Species		
INPS surveys	Annual FNAI surveys	Annual FNAI surveys
INPS treatment	Annually treat 90 % of sites located during previous years' surveys in HQNA within 1 mile of urban interface	Annually treat 90 % of sites located during previous years' surveys in HQNA within 1 mile of urban interface

INPS = invasive non-native plant species; CWA = Clean Water Act; T&E = threatened and endangered; FNAI = Florida Natural Areas Inventory; HQNA = high-quality natural area

2.3.5 Nuisance and Non-native Animal Management and BASH

Nuisance and non-native animal management and bird/wildlife aircraft strike hazard (BASH) activities would continue under the proposed action (Table 2-4).

Table 2-4. Nuisance and Non-Native Animal Management and BASH

Activity	No Action	Proposed Action
Feral hogs	Hog surveys in flatwoods salamander ponds, steepheads, and seepage slopes Hog control as needed in sensitive habitats	Hog surveys in flatwoods salamander ponds, steepheads, and seepage slopes Hog control as needed in sensitive habitats
SRI predator control	Biannual predator track counts and follow-up control efforts by USDA	Biannual predator track counts and follow-up control efforts by USDA
Nuisance animal responses	As needed	As needed
BASH responses	USDA manages	USDA manages

BASH = bird/wildlife aircraft strike hazard; USDA = U.S. Department of Agriculture

2.3.6 Ecological Monitoring

The NRS would continue to monitor key communities and their response to management activities to better inform future management decisions (Table 2-5). Remote sensing and spatial modeling tools would continue to be used as a component of this program.

Table 2-5. Ecological Monitoring

Activity	No Action	Proposed Action
Longleaf Pine Sandhills and Flatwoods	200 1-hectare plots sampled one growing season after management activity, or at least every 5 years	200 1-hectare plots sampled one growing season after management activity, or at least every five years
Seepage Slopes	28 slopes monitored on 4-year cycle	28 slopes monitored on 4-year cycle
Steephead Streams	32 steepheads monitored on 4-year cycle	32 steepheads monitored on 4-year cycle
Biological, chemical, and physical stream surveys	Annual assessments in tributaries to Yellow and Shoal Rivers Before and after restoration sampling (6 months, 1 year, 5 years) at 10 sites	Annual assessments in tributaries to Yellow and Shoal Rivers Before and after restoration sampling (6 months, 1 year, 5 years) at 10 sites

2.3.7 Protected Species Management and Monitoring

Under the Proposed Action, protected species management and monitoring efforts would remain focused on the 11 federally listed and select state-listed species present on the Eglin Reservation. To protect migratory bird species, Eglin NRS will continue with surveys and impact minimization measures for military activities (Table 2-6). The NRS would also continue to support the military mission by conducting ESA and MMPA consultations, participating in the EIAP process, and improving Eglin's process for tracking implementation of natural resources requirements (Table 2-6).

Table 2-6. Protected Species Management and Monitoring

Species	No Action	Proposed Action
Mainland Eglin		
RCW	Focused on 350 MEA. Annually conduct tree checks on all active cluster and inactive recruitment clusters; conduct group check on 33% of active clusters annually. Cavity inserts. Translocation. Prescribed fire, forest management, ecological monitoring.*	Focused on CCA and 450 MEA, particularly on the east side. Annually conduct tree checks on all active cluster and inactive recruitment clusters; conduct group check on 25% of active clusters annually. Cavity inserts. Translocation. Prescribed fire, forest management, ecological monitoring.*
Reticulated flatwoods salamander	100% annual dip net sampling of known ponds (18). Years when known sites occupied, resample 20-50 % of potential ponds. Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management.*	100% annual dip net sampling of known ponds (20 ponds as of 2012). Years when known sites occupied, resample 20-50 % of potential ponds. Mid-story hardwood control. Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management.*
Okaloosa darter	Visual surveys within a 20-meter reach at each of 28 sites. Ecological monitoring, habitat restoration, and nuisance and non-native species management.*	Visual surveys within a 20-meter reach at each of 28 sites. Ecological monitoring, habitat restoration, and nuisance and non-native species management.*

Table 2-6. Protected Species Management and Monitoring, Cont'd

Species	No Action	Proposed Action
Gulf sturgeon	Summer tracking in rivers and bays. Winter tracking in Gulf, bays. Habitat restoration.*	Summer tracking in rivers and bays. Winter tracking in Gulf, bays. Habitat restoration.*
Indigo snake	Pre-land disturbing project surveys and relocation if found. Prescribed fire.*	Pre-land disturbing project surveys and relocation if found. Prescribed fire.*
Freshwater mussels	Habitat restoration.*	Annual surveys in rivers adjacent to Eglin. Habitat restoration.*
Gopher tortoise	Monitor all known gopher tortoise populations at 3-5 year intervals. Pre-land disturbing project surveys and relocation. Prescribed fire.*	Annually monitor status of 20% of known tortoise burrows from previous surveys. Low intensity monitoring program. Pre-land disturbing project surveys and relocation. Maintain relocation sites. Prescribed fire. *
Bald eagle	Weekly survey during nesting season at nests accessible by foot. Post primary zone (330 feet) around bald eagle nests during the nesting season.	Weekly survey during nesting season at nests accessible by foot. Post primary zone (330 feet) around bald eagle nests during the nesting season.
Florida burrowing owl	Monthly surveys. Maintain T perches. Trims vegetation around burrows where necessary. Prescribed fire.*	Monthly surveys during breeding season. Maintain T perches. Trims vegetation around burrows where necessary. Prescribed fire. *
Florida black bear	Assist with complaints about nuisance bears. Maintain sightings/mortalities database.	Assist with complaints about nuisance bears. Maintain sightings/mortalities database.
Florida bog frog	100% annual resurvey of known bog frog locations with three visits to each site. Sample potential new sites once every 3 years. Prescribed fire, habitat restoration, and nuisance and non-native species management.*	100% annual resurvey of known bog frog locations with three visits to each site. Annually resample a portion of sites in close proximity to known sites where bog frogs have not been found. Prescribed fire, habitat restoration, and nuisance and non-native species management.*
Migratory birds	Surveys prior to tree removal at certain times of year. Screening of inactive RCW trees to ensure migratory species do not occupy these trees prior to removal. Roof surveys for least tern colonies. Survey for and post shorebird nests on SRI for mission avoidance. Mark "T" perches for burrowing owls. Remove excess woody vegetation directly adjacent to active burrowing owl burrows. Post a 330-foot buffer around bald eagle nests during nesting season.	Surveys prior to tree removal at certain times of year. Screening of inactive RCW trees to ensure migratory species do not occupy these trees prior to removal. Roof surveys for least tern colonies. Survey for and mark shorebird nests on SRI for mission avoidance. Mark "T" perches for burrowing owls Remove excess woody vegetation directly adjacent to active burrowing owl burrows. Post a 330-foot buffer around bald eagle nests during nesting season.

Table 2-6. Protected Species Management and Monitoring, Cont'd

Species	No Action	Proposed Action
Santa Rosa Island and Cape San Blas		
Sea turtles	Daily monitoring May 1 to Oct 31. Mark and place protective screening over all nests at SRI. Nuisance and non-native species management.*	Daily monitoring May 1 to Oct 31 Mark and place protective screening over all nests at SRI. Nest sitting to direct disoriented hatchlings to water at SRI. Ensure continued compliance of Gulf County with the real-estate lease which outlines the restrictions for beach driving on Cape San Blas. Nuisance and non-native species management.*
<i>Cladonia</i>	Population estimate every 5 years; more often if major storm event. Maintain fencing and posting at 4 sites. Habitat restoration.*	Population estimate every 5 years; more often if major storm event. Maintain fencing and posting at 4 sites. Habitat restoration.*
Piping plover	Surveys every two weeks from July to May at half-mile intervals on south side of SRI, and appropriate habitat on north side. Maintain posting at one habitat area on SRI.	Surveys every two weeks from July to May at half-mile intervals on south side of SRI, and appropriate habitat on north side. Maintain posting at 3 habitat areas on SRI. Establish closed area posting on north side of SRI.
Santa Rosa beach mouse	Annually conduct four track count surveys and four tracking tube surveys at 10 transects. Nuisance and non-native species management.*	Conduct one sand track count survey every quarter, and conduct tracking tube surveys once every six months at 10 predetermined transects. Nuisance and non-native species management.*
Shorebirds	Survey every two weeks from Oct-Aug at SRI. Monthly survey at CSB. Weekly nesting surveys from March to July. Mark nests potentially impacted by the public or mission activities. Nuisance and non-native species management.*	Survey every two weeks year-round at SRI Monthly survey at CSB. Weekly nesting surveys from March to July. Mark nests potentially impacted by the public or mission activities. Nuisance and non-native species management.*

CSB = Cape San Blas; MEA = management emphasis area; RCW = red-cockaded woodpecker; SRI = Santa Rosa Island

* Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management activities that benefit T&E species are covered in those respective sections.

2.3.8 Recreation Management

Eglin supports a variety of recreational opportunities (Table 2-7). Eglin's hunting management units were restructured prior to the 2010-2011 season. The units have been re-designated to create seven larger units. Additionally, the area surrounding the 7SFG(A) cantonment, formerly Management Units 6B and 6C, has been closed to all forms of public recreation, with the exception of the Duck Pond area, which is still open for recreation but closed to hunting. Another change to the recreation program is the introduction of a daily public access map (PAM), which informs the public via the Internet of short-term closure of open recreational areas. Prior to entering the Reservation, all recreationalists must first view the PAM to verify area availability.

Table 2-7. Recreation Management

Activity	No Action	Proposed Action
Hunting and Fishing		
Available hunting acres	248,321	248,321
Quail management emphasis area	Herbicide treatment for 100 acres annually	Herbicide treatment for 100 acres annually
Timberlake dove fields	None	Reestablish LLP on portions of Timberlake dove fields and buffer
Special opportunity hunts	Mobility impaired, youth, and turkey special hunts	Mobility impaired, youth, and commanders special hunts
Fishing	29 ponds, 252 acres, four ponds stocked with grass carp for weed control	29 ponds, 252 acres, four ponds stocked with grass carp for weed control
Annual youth fishing rodeo	One annually, 200 youth participants	One annually, 200 youth participants
High-intensity pond management	Maintain high intensity management of Indigo and Duck ponds	Maintain high intensity management of Indigo and Duck ponds; establish Anderson Pond as high intensity by 2013
Recreational impoundment spillway structure renovation	One annually	One annually
Non-consumptive Recreation		
Camp sites and day use areas	Manage 15 primitive camp sites and nine day use areas	Manage 15 primitive camp sites and nine day use areas
Florida Scenic Trail	Florida Trail Association (FTA) is responsible for trail maintenance; 8 campsites	FTA is responsible for trail maintenance; 8 campsites; FTA to finish last of trail on Eglin
Timberlake bike trail system	26 miles of trails	26 miles of trails
Beach access	Official beach access points/4 miles public beach at SRI and 3 miles at CSB; CSB allows beach driving on non-interference basis. Beaches are closed to activities from sunset to sunrise—signs will be made and posted at each access point.	Official beach access points/4 miles public beach at SRI and 3 miles at CSB; CSB allows beach driving on non-interference basis. Beaches are closed to activities from sunset to sunrise—signs will be made and posted at each access point.
Canoeing	Trims low branches on Turkey, Rocky, Alaqua, and Boiling Creeks	Trims low branches on Turkey, Rocky, Alaqua, and Boiling Creeks

CBS = Cape San Blas; FTA = Florida Trail Association; SRI = Santa Rosa Island

2.4 MANAGEMENT REQUIREMENTS

Although almost all INRMP activities are intended to improve the health of Eglin's natural resources, certain management activities have the potential to cause negative side effects. The management requirements in Chapter 5 would minimize these potential negative effects. This EA was prepared with consideration that the management requirements in Chapter 5 would be employed for INRMP activities. The NRS is responsible for ensuring these management requirements are implemented.

2.5 COMPARISON OF ALTERNATIVES

Table 2-8 presents an alternative comparison based on the potential environmental impacts, both positive and negative, associated with the changes in the implementation of actions in the INRMP.

2.6 PREFERRED ALTERNATIVE

The Preferred Alternative, which is also the Proposed Action, is to further the moderate, balanced approach between addressing stewardship requirements and mission sustainment and flexibility while meeting new requirements and incorporating improved methods. The Proposed Action is the most responsive alternative in addressing the issues identified during the INRMP update planning meetings. The Proposed Action involves re-prioritizing NRS's program management component activities (as described in Section 2.1) in order to support NRS's overall management program focus points (listed in Section 1.2).

Table 2-8. Summary Matrix of Issues, Proposed Action and Alternatives, and Potential Impacts

Issue	Action Alternative	
	No Action	Proposed Action
Air	Prescribed burning has the potential for adverse impacts to air quality due to smoke. However, impacts are temporary, with populations of concern being elderly and small children.	An increase in prescribed burning activity under the Proposed Action would slightly increase the potential for adverse impacts to air quality. However, as with the No Action Alternative, potential impacts would be temporary.
Soils	Continued control measures would minimize erosion from forestry, fire, and habitat restoration activities. Erosion control projects will benefit landforms and soils of the Eglin Reservation.	Same as No Action Alternative.
Floodplains	Although NRS management activities may occur in floodplains, NRS engages in management strategies that minimize potential impacts to these areas, such as only using rubber tired vehicles in floodplain areas and implementing buffer zones in areas prone to flooding for chemical applications associated with vegetation management. As a result, potential impacts to floodplains would be minimal, with no major, long-term impacts to the quality, utility, or dynamics of floodplains on Eglin.	Same as No Action Alternative.
Water Resources	Water resources would benefit from continued erosion control activities road closure/rehabilitation, and borrow pit reclamation. With BMP implementation, forest management, wildfire support, and habitat restoration activities would have no significant impacts associated with erosion or herbicide use.	Same as No Action Alternative.
Biological Resources	Although there is the potential for negative impacts to some habitats and animals during prescribed fires and wildfires (particularly in UXO Limited Suppression Areas), overall natural resources management would be beneficial for species and habitats. There would be no significant impacts to biological resources under the No Action Alternative due to noise, physical impacts, or habitat alteration. The potential for adverse impacts would be decreased by implementation of management actions.	Although there is the potential for negative impacts to some habitats and animals during prescribed fires and wildfires (particularly in UXO Limited Suppression Areas), overall natural resources management would be beneficial for species and habitats. The addition of four new firefighter positions would reduce potentially damaging effects from fires. There would be no significant impacts to biological resources under the Proposed Action due to noise, physical impacts, or habitat alteration. The potential for adverse impacts would be decreased by implementation of management actions.
Recreation	NRS would continue to provide recreational opportunities. No significant adverse impacts would occur.	Public access is improved by the Public Access Map. Other impacts would be similar to the No Action Alternative.

Table 2-8. Summary Matrix of Issues, Proposed Action and Alternatives, and Potential Impacts, Cont'd

Issue	Action Alternative	
	No Action	Proposed Action
Safety	Potential safety hazards to the public and Eglin AFB personnel and property may result from long wildfire response times.	Hiring four new firefighter positions would help provide adequate response time to wildfires, thus enhancing safety for Eglin and surrounding communities. Potential safety concerns associated with an increase in prescribed burning acreage. However, use of BMPs, such as smoke modeling, would minimize impact potentials.
Chemical Materials	With implementation of management requirements, no adverse impacts associated with use of herbicides are anticipated.	Same as No Action Alternative.
Cultural Resources	Habitat management activities such as erosion control and forestry have the potential to adversely impact cultural resource areas. However, work plans are coordinated with 96 CEG/CEVSH, and NRS uses BMPs to avoid potential impacts. Any impacts would therefore be minimal, and CEVSH is notified of any occurrences.	Increased level of effort in forestry activities creates an increased potential for impact. However, potential impacts are minimized through CEVSH coordination and use of BMPs.
Socioeconomics	Continued coordination and involvement with the scientific, regulatory, and local community would provide benefits to these entities as well as Eglin and NRS.	Increased coordination and involvement with the scientific, regulatory, and local community would provide greater benefits to these entities as well as Eglin and NRS than realized under the No Action Alternative.

96 CEG/CEVSH = Eglin Cultural Resources Section; BMP = best management practice; NRS = Eglin Natural Resources Section; UXO = unexploded ordnance.

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 AIR QUALITY

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutants such as ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and particulate matter (PM), are considered criteria air pollutants for which an ambient air quality standard has been set.

The baseline standards for criteria pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare (Table 3-1). Based on measured ambient air pollutant concentrations, the U.S. Environmental Protection Agency (USEPA) designates whether areas of the U.S. meet the NAAQS. Those areas demonstrating compliance with the NAAQS are considered “attainment” areas, while those not in compliance are known as “nonattainment.” Those areas that cannot be classified on the basis of available information for a particular pollutant are “unclassifiable” and are treated as attainment areas until proven otherwise.

Greenhouse Gases

Global climate change has become one of the most relevant and contentious issues facing citizens and policy-makers both in the U.S. and worldwide. Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth’s temperature. Climate projections for the U.S. indicate continued warming in all seasons, higher heat indices, increased drought, and more intense hurricanes (IPCC, 2007).

Direct temperature effects such as increasing mortality due to heat intolerance, along with increasing tropospheric ozone pollution, and the possibility of increasing the frequency of extreme weather events, led the USEPA to a look at the CAA as it relates to climate change. These key scientific facts supported the USEPA’s determination that the combined emissions of six greenhouse gases in the atmosphere may “reasonably” be anticipated to endanger public health and welfare (USEPA, 2009). The endangerment finding was issued in response to a Supreme Court case (*Massachusetts vs. USEPA*, 549 U.S. 497, 2007), in which the Supreme Court found GHGs to be pollutants covered under the CAA.

The six primary GHGs, which are defined in Section 19(i) of Executive Order 13514 and internationally recognized and regulated under the Kyoto Protocol, are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Currently, there are no standards like the NAAQS for greenhouse gases.

Table 3-1. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon monoxide	9 ppm (10 mg/m ³)	8 hours ^a	None	
	35 ppm (40 mg/m ³)	1 hour ^a		
Lead	0.15 µg/m ³ ^b	Rolling 3-month average	Same as primary	
	1.5 µg/m ³	Quarterly average	Same as primary	
Nitrogen dioxide	53 ppb ^c	Annual (arithmetic average)	Same as primary	
	100 ppb	1 hour ^d	None	
Particulate matter (PM ₁₀)	150 µg/m ³	24 hours ^e	Same as primary	
Particulate matter (PM _{2.5})	15.0 µg/m ³	Annual ^f (arithmetic mean)	Same as primary	
	35 µg/m ³	24 hours ^g	Same as primary	
Ozone	0.075 ppm (2008 std)	8 hours ^h	Same as primary	
	0.08 ppm (1997 std)	8 hours ⁱ	Same as primary	
	0.12 ppm	1 hour ^j	Same as primary	
Sulfur dioxide	0.03 ppm	Annual (arithmetic average)	0.5 ppm (1,300 µg/m ³)	3 hours ^a
	0.14 ppm	24 hours ^a		
	75 ppb ^k	1 hour	None	

Source: USEPA, 2011a (Federal Standards); FAC 62-204.240, 2006 (Florida Standards)

ppm = parts per million; mg/m³ = milligrams per cubic meter; NAAQS = National Ambient Air Quality Standards; µg/m³ = micrograms per cubic meter

(1) Not to be exceeded more than once per year

(2) Not to be exceeded more than once per year on average over 3 years

(3) To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard, and the implementation rules for that standard, will remain in place for implementation purposes as the USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.

(b) As of June 15, 2005 the USEPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

3.1.1 Affected Environment

Region of Influence

Climate

Eglin AFB is characterized by a humid subtropical climate with hot, humid summers and mild winters. The Gulf of Mexico moderates temperatures at Eglin AFB; however, this influence decreases just a few miles inland. The northern part of the range is influenced by a continental climate, where the day to night temperature differential is greater. Average yearly temperature is approximately 76 degrees Fahrenheit (°F) with a range from maximum average daily

temperatures of near 90 °F in the summer to a minimum average of 42 °F in the winter. There is no pronounced dry season, but precipitation is normally higher during the summer months (June through August), which are dominated by convective thunderstorms (sea breeze).

Existing Conditions

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of the sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, normally a year. These annual rates are typically represented in tons per year. Inventory data establishes relative contributions to air pollution concerns by classifying sources and determining the adequacy as well as the necessity of air regulations. Accurate inventories are imperative for the development of appropriate air quality regulatory policy.

For comparison purposes, Table 3-2 presents the USEPA's 2002 National Emissions Inventory (NEI) data for Santa Rosa, Okaloosa, and Walton Counties (USEPA, 2002). The county data includes emissions from point sources, area sources, and mobile sources. Point sources are stationary sources that can be identified by name and location. Area sources are point sources whose emissions are too small to track individually, such as a home or small office building or a diffuse stationary source, such as wildfires or agricultural tilling. Mobile sources are any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and non-road. On-road mobile sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Non-road sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2002).

In the past, a combination of the CAA Prevention of Significant Deterioration Rule's 250-ton-per-year threshold for new or modified stationary sources and the General Conformity Rule's regional significance threshold of 10 percent of the region's emissions has often been used to indicate significance/nonsignificance for air quality impacts. However, the USEPA recently promulgated a revised General Conformity Rule that abolished the regional significance threshold for federal actions in nonattainment or maintenance areas ("Revisions to the General Conformity Regulations," 75 *Federal Register* 17254, April 5, 2010). Given that change, as well as other considerations, a slightly different methodology is being used for this EA.

In order to evaluate air emissions and their impact on the ROI, the emissions associated with the project activities were compared with the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data. Potential impacts to air quality were evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity (40 Code of Federal Regulations [CFR] 1508.27). Thus, the significance of the action must be analyzed in respect to the setting of the Proposed Action and relative to the severity of the impact. The CEQ NEPA regulations (40 CFR 1508.27[b]) provide 10 key factors to consider in determining an impact's intensity.

Table 3-2. Baseline Emissions Inventory for Santa Rosa, Okaloosa, and Walton Counties

Source Type	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Okaloosa County					
Non-Point and Mobile Sources	96,594	7,864	7,846	1,418	19,157
Point Sources	28	49	8	12	79
Total	96,622	7,913	7,854	1,430	19,236
Santa Rosa County					
Non-Point and Mobile Sources	85,511	7,211	9,677	1,144	17,225
Point Sources	867	4,570	332	2,362	418
Total	86,378	11,781	10,009	3,506	17,643
Walton County					
Non-Point and Mobile Sources	52,111	5,390	4,208	543	9,706
Point Sources	28	14	2	4	28
Total	52,139	5,404	4,210	547	9,734
Region of Influence					
Non-Point and Mobile Sources	234,216	20,465	21,731	3,105	46,088
Point Sources	923	4,633	342	2,378	525
Total	235,139	25,098	22,073	5,483	46,613

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound

To provide for a more conservative analysis, Santa Rosa, Okaloosa, and Walton County was selected as the ROI instead of the USEPA-designated air quality control region, which is a much larger area. To identify impacts, calculated air emissions were compared with the annual total emissions of the ROI as represented in the 2002 NEI. The air quality analysis focused on emissions associated with prescribed fire and vehicles.

Greenhouse Gases

The six primary GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Only emissions of CO₂, CH₄, and N₂O are considered in this EA. The other constituents do not apply to this EA.

Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth's surface. To allow GHGs to be compared to each other, each GHG quantity is translated into a common unit called the "carbon dioxide equivalent" (CO₂e).

There are no established thresholds for greenhouse gases, but in draft guidance issued February 18, 2010, the CEQ suggested that proposed actions that are reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent should be evaluated by quantitative and qualitative assessments.

There isn't currently a GHG inventory for the 3 county ROI. The existing inventories are for the entire state, and for Eglin AFB. Table 3-3 show the total CO₂e data that is currently available at

the time of this EA. Eglin AFB's Greenhouse Gas emissions are 0.2% of the entire state of Florida.

Table 3-3. Greenhouse Gas Inventory Totals

GHG Emissions (CO ₂ e)	tons/yr
State of Florida ^{1*}	371,039,926
Eglin AFB ^{2**}	914,894

Sources: ¹Strait et al, 2008; ²U.S. Air Force, 2011b.

CO₂e = carbon dioxide equivalent

*Total CO₂e for CY2005

**Total CO₂e for FY2010

3.1.2 Environmental Consequences

3.1.2.1 Proposed Action

Prescribed Fire

Prescribed fires are conducted within limits of the *Wildland Fire Management Plan*, which describes the acceptable range of weather, moisture, fuel, and fire behavior patterns, as well as the ignition method to achieve the desired results (U.S Air Force, 2011c). Air emissions from prescribed burns are dependent on the size and intensity of the fire, and the type of vegetation being burned. The size and intensity of any fire depends upon the meteorological conditions, the species of vegetation involved and their moisture content, and the weight of the consumable fuel per acre (available fuel loading). Potential impacts to air quality would result from emissions related to the fire, such as smoke emissions, and from the equipment used before and during a prescribed burn.

Fire Emissions

While prescribed fires can produce large amounts of gases such as carbon monoxide, carbon dioxide, hydrocarbons, and nitrogen and sulfur oxides, the affect on regional scale air quality is minimal. Forests that receive prescribed burn treatments benefit from a reduction of other activities which can produce even higher volumes of pollutants, such as devastating wildfires and the use of pesticides and herbicides,

Local problems, however, are more frequent and occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time. For public health and welfare, particulate matter (PM) in smoke is the pollutant of primary concern. PM can cause serious health problems such as increased respiratory symptoms and disease, decreased lung function, and even premature death. Smoke also impacts visibility conditions by scattering and absorption of light by particles and gases. Fine particles are more efficient than large particles at scattering light. Visibility is an important public welfare consideration because it impacts enjoyment of daily activities.

The proposed action would increase the acreage burned under the prescribe fire program from an average (5-year) of 86,000 acres under the no action alternative to 90,000 acres. Table 3-4 shows the emissions of CO, NO_x, PM, and VOCs related to prescribed fire emissions. More

information is given on assumptions and calculation methodologies in Appendix A. Emissions of PM represent the highest percentage of the ROI.

Table 3-4. Proposed Action - Criteria Pollutant Emissions from Prescribed Fires Compared to the County Emissions

Activity	Emissions (tons/yr)			
	CO	NO _x	PM	VOC
Prescribed Burning	36,394	802	5,371	741
Total ROI Emissions	235,139	25,098	22,073	46,613
% of ROI	15.5%	3.2%	24.3%	1.6%

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound; ROI = Region of Influence

Although, the emissions from prescribed burning are relatively higher than other emission sources, if a wildfire were to occur in its place, pollutant emissions, especially PM, would be significantly higher. The reduction of wildfire, coupled with the ecological benefits of prescribed fire, make it an essential part of managing natural resources.

As a comparison, Table 3-5 shows the concentrations of pollutants compared to the National Ambient Air Quality Standards. PM emissions are relatively higher, but all pollutants have concentrations well below the national standards. Any visibility impairments will be temporary. No significant impacts are expected under the proposed action if NRS continues to take every precaution to ensure that potential impacts to the area associated with reduced air quality from prescribed burns are minimized.

Table 3-5. Proposed Action - Fire Emissions Compared to the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	5.6E-03
	8-Hour	9	3.906E-03
NO _x	Annual	0.053	5.981E-06
SO ₂	3-Hour	0.5	--
	24-Hour	0.14	--
	Annual	0.03	--
PM ₁₀	24-Hour	150 µg/m ³	0.38 µg/m ³
	Annual	50 µg/m ³	0.08 µg/m ³

ppm = parts per million; CO = Carbon Monoxide; µg/m³ = micrograms per cubic meter; NO_x = Nitrogen Oxides; PM = Particulate Matter; SO₂ = Sulfur Dioxide; VOC = Volatile Organic Compound

Eglin NRS would continue to utilize day of burn weather forecasts and smoke models (VSMOKE) as guides for wind speed and direction in order to manage smoke effects by burning on days when smoke will blow away from smoke-sensitive areas. Figure 3-1 is an example of the VSMOKE model output showing the direction and expanse of the smoke plume from a fire. They will also continue to submit notifications when they plan to burn.

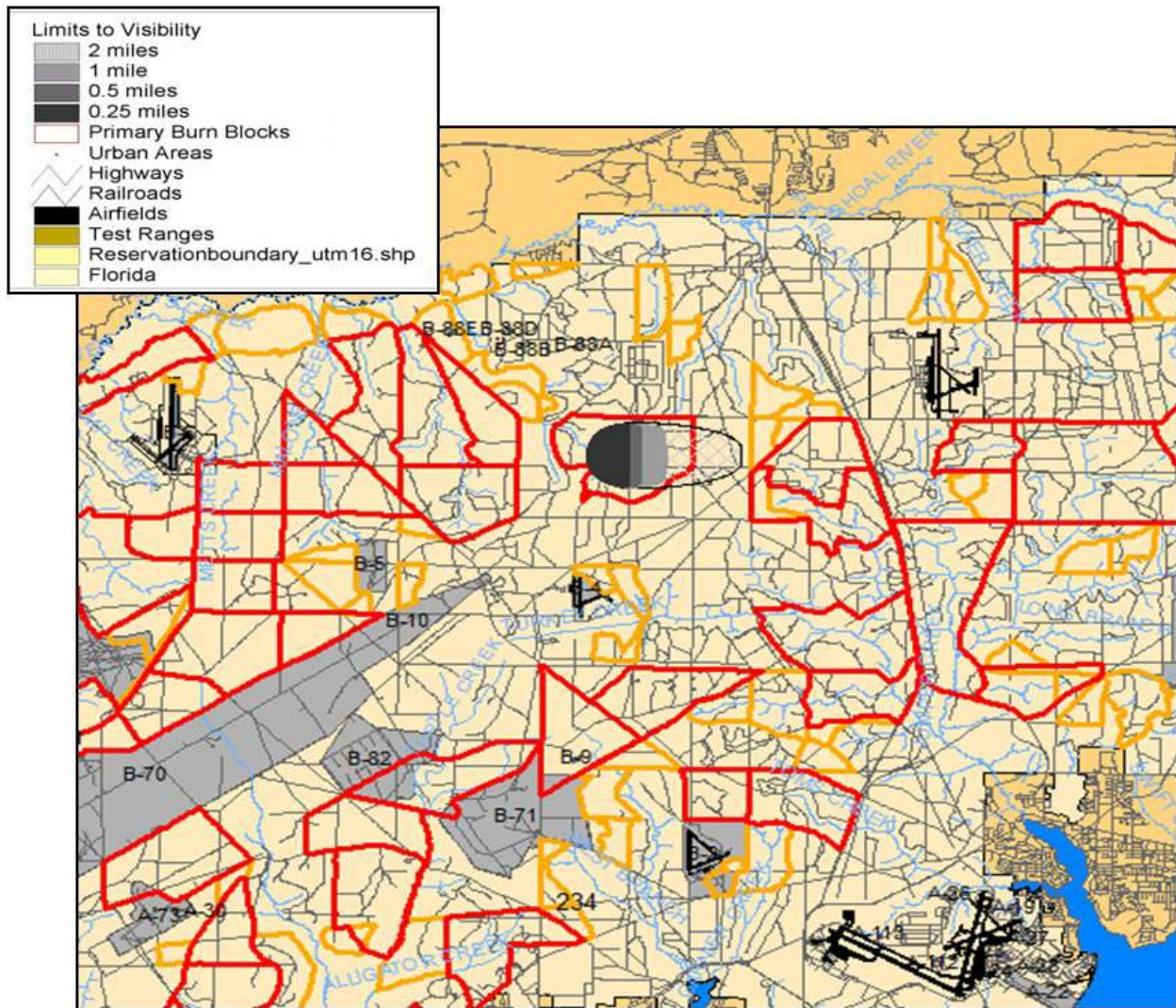


Figure 3-1. Example of the Smoke Model Output

The program is supported by tools such as the Natural Resources /Section Decision Support System, which provides real-time analysis and reporting of data determined to be vital to the management of Eglin's natural resources. Another important Eglin developed tool is the Prescribed Fire Prioritization Model, which uses ecological information in a spatial modeling framework to determine the areas in greatest need of fire. It synthesizes multiple data layers including fire history, ecosystem health information (based on remote sensing and ground surveys), mission requirements, presence of rare, fire-dependent species, management objectives, smoke management constraints and forest management activities. Figure 3-2 shows an example of the Prescribed Fire Prioritization Model output. The output is a prioritized landscape management map that guides day-to-day activities on the ground, as well as short term and long range planning efforts.

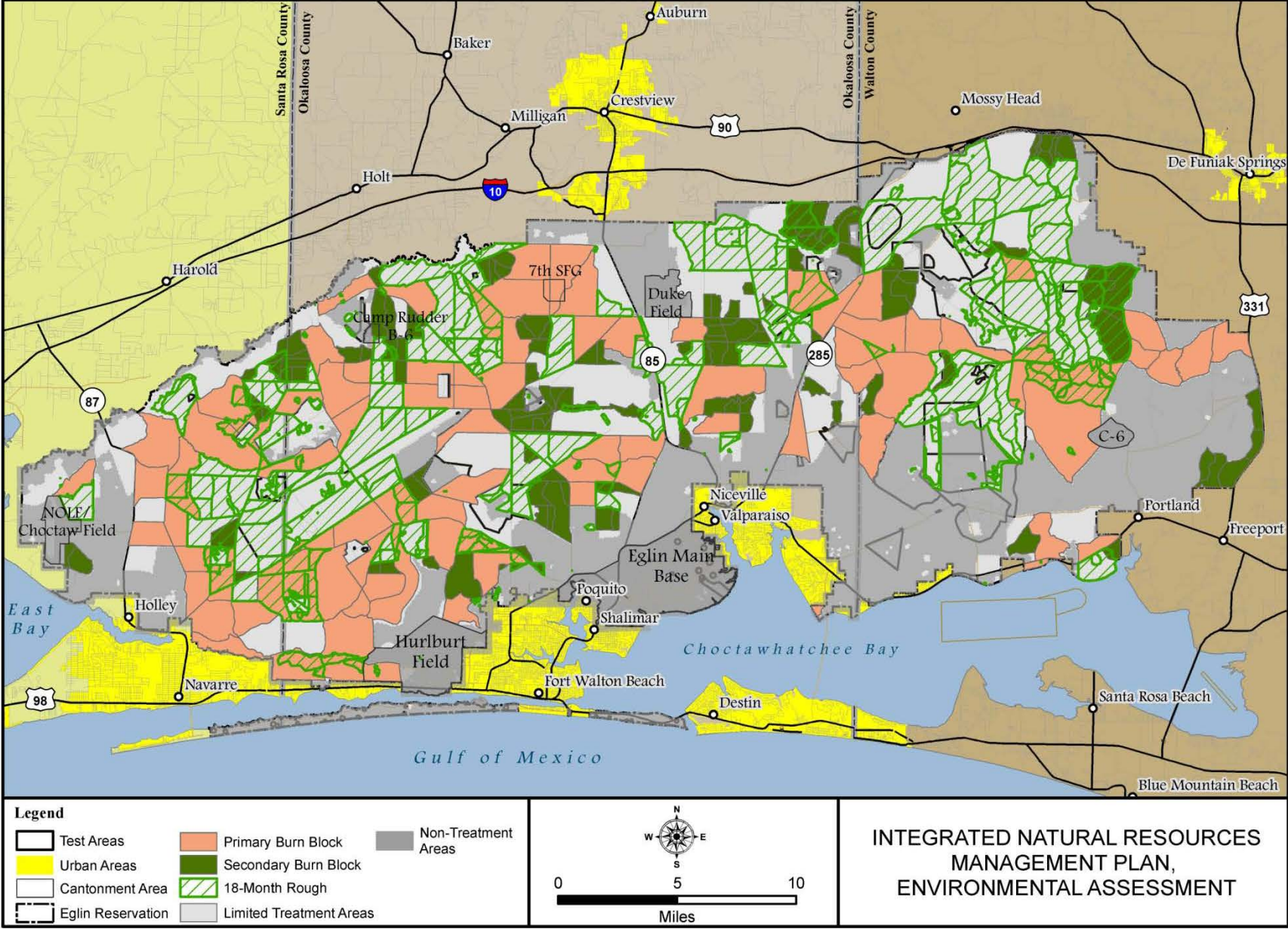


Figure 3-2. Example of the Prescribed Fire Prioritization Mod//881

Greenhouse Gases from Prescribed Fire

During intense flaming fires, complete combustion occurs and carbon stored in the biomass is converted to CO₂, and nitrogen to N₂O. When combustion is incomplete, for example during smoldering, carbon is released as CO and CH₄. Most of the greenhouse gas emissions are CO₂, CH₄, and N₂O.

The annual emissions of these pollutants are shown in Table 3-6. Details of the calculation methodology are in Appendix A.

Table 3-6. Proposed Action - Annual Greenhouse Gases from Prescribed Fire Emissions under the Proposed Action

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Prescribed Burning	432,270	23,247	19,251	474,768

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Annually, approximately 475,000 tons (431,000 metric tons) of CO₂e would be emitted under the proposed action. The emissions of greenhouse gases from prescribed burns are above the CEQ level of 25,000 metric tons of CO₂e per year, and thus, impacts should be considered more thoroughly.

The impacts are, by nature, global and very difficult to accurately quantify. These emissions are just one part of the carbon cycle and do not include carbon sequestered (See *Forest Management-Greenhouse Gases-Carbon Sequestration*). Currently, there are no tools to accurately described the role prescribed burning has in the carbon cycle. Also, the emissions here may be somewhat overestimated, as a conservative approach has been taken in which it is assumed that 65 percent of the fuel is consumed. In the future, burns will be evaluated by Eglin NRS for burn severity to determine the percent area burned (U.S. Air Force, 2011c). This will more accurately describe the air emissions by accounting for percent area consumed. The Eglin Fire Management Element plans to use the Consume 3.0 model (U.S. Air Force, 2011c) to more accurately determine the fuel consumption.

Furthermore, it is important to note that recent research suggests that prescribed burning could reduce CO₂ emissions by 52 to 68 percent (Wiedinmyer and Hurteau, 2010) by reducing the risk of wildfire. The research indicates that forest maintenance can result in a lower risk of severe wildfire for the treated areas. This reduced risk has a two-fold effect on the carbon cycle:

- 1) Direct effect—emissions of GHGs are reduced when areas are treated with prescribed burns versus wildfires.
- 2) Indirect effect—by treating the area, the live stands of trees will retain higher capacity to sequester carbon dioxide compared to stands killed by severe wildfires. (USFS, 2009)

Fire is a natural part of a forest's carbon cycle. As such, there are no significant impacts expected under the proposed action. The reduction of wildfire, coupled with the ecological benefits of prescribed fire, make it an essential part of managing natural resources. Eglin

prescribed fire program represents only 4.5% of the controlled burns in the state of Florida. The state of Florida treats over 2 million acres with prescribed fire each year (FDOF, 2011).

Equipment/vehicle Emissions related to Prescribed Fire

In order to manage prescribed burns various types equipment are needed including fire engines, tractors and tractor transport trucks, pickup trucks. ATVs with drip torches are used in most burns to ignite the fire; however, a helicopter is used for aerial ignitions of large scale prescribed fires. Using the aerial ignition technique:

- Minimizes smoke impacts due to better convective lift and earlier completion time
- Maximizes use of limited weather windows
- Increases situational awareness during burn:
- Provides quick feedback of changes in fire behavior
- Provides a cost effective firing technique for large scale burns
- Increases firefighter safety
- Increases distance from UXO

Annual emissions resulting from the equipment used in support of prescribed burn activities are shown in Table 3-7. Details of the calculation methodology are in Appendix A.

Table 3-7. Proposed Action - Emissions of Criteria Pollutants from Prescribed Fire Support Equipment

Emissions by Equipment	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Tractor	0.02	0.06	0.01	0.02	0.00
ATVs	4.64	0.04	0.01	0.00	0.48
Fire Engines	0.03	0.02	0.13	0.00	0.02
Tractor Transport Truck	0.02	0.01	0.06	0.00	0.01
Pickup Truck	0.16	0.01	0.06	0.00	0.01
Helicopter ¹					
Ground Idle	0.26	0.03	0.00	0.00	0.09
Flight Idle	0.27	0.03	0.00	0.00	0.08
Cruise	0.28	0.52	0.00	0.00	0.02
Total	5.68	0.72	0.27	0.03	0.71

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound; ROI = Region of Influence

¹ A UH-1 Helicopter was used as a proxy;

As a comparison, Table 3-8 shows the concentrations of pollutants compared to the National Ambient Air Quality Standards. Use of equipment in support of prescribed fires results in minimal and temporary emissions of air pollutants and significant impacts are not expected.

Table 3-8. Proposed Action - Air Emissions from Equipment Use in Support of Prescribed Fires Compared to the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	1.256E-06
	8-Hour	9	8.793E-07
NO _x	Annual	0.053	7.794E-09
SO ₂	3-Hour	0.5	2.328E-08
	24-Hour	0.14	1.035E-08
	Annual	0.03	2.070E-09
PM ₁₀	24-Hour	150 µg/m ³	2.723E-06
	Annual	50 µg/m ³	5.447E-07

ppm = parts per million; CO = Carbon Monoxide; µg/m³ = micrograms per cubic meter; NO_x = Nitrogen Oxides; PM = Particulate Matter; SO₂ = Sulfur Dioxide; VOC = Volatile Organic Compound

Greenhouse Gases from Equipment/vehicles related to Prescribed Fire

All equipment with the exception of the ATVs and helicopter are diesel powered. ATVs are gas powered and the helicopter uses JP-8. Greenhouse gas emissions from use of the equipment including travel time are shown in Table 3-9.

Table 3-9. Proposed Action - Annual Greenhouse Gas Emissions from Equipment Used in Support of Prescribed Burns

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Prescribed Burning	581	0	1	583
Total	581	0	1	583

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Annually, approximately 600 tons (~530 metric tons) of CO₂e would be emitted under the proposed action due to equipment use in support of prescribed burning. The emissions of greenhouse gases from equipment use in support of prescribed burns are well below the CEQ level of 25,000 metric tons of CO₂e per year, and thus, impacts are not expected to be adverse or significant under the proposed action.

Wildfire Support

A wildfire is a natural process that consumes various types of vegetative fuels, and can spread quickly if proper measures are not taken. The pollutant emissions from wildfires can be higher per acre in areas that have not been managed by prescribed burning. This is because the fuel loading, or available vegetation to burn, increases due to a denser amount of understory and due to an increased amount of debris material on the forest floor. Wildfire emissions are analyzed separately in applicable mission REAs that cover fire starter missions; however, these emissions are summarized below. Eglin Natural Resources' prescribed burning program reduces the number and size of wildfires that occur on the range each year.

Fire Emissions

Wildfires may emit large quantities of PM₁₀, PM_{2.5}, and carbon monoxide for several hours or even days. However, emissions from fires tend to have a relatively temporary, short-term effect on air quality (USEPA, 2011b). The Eglin Wildland Fire Management Program reduces the threat of wildfire and increased emissions by the prescribed fire program.

Table 3-10. Proposed Action - Criteria Pollutant Emissions from Wildfires

Activity	Emissions (tons/yr)			
	CO	NO _x	PM	VOC
Wildfires	4,396	125	536	754
Total ROI Emissions	235,139	25,098	22,073	46,613
% of ROI	1.9%	0.5%	2.4%	1.6%

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound; ROI = Region of Influence

The overall impact to air quality in the region would be minimal over the long-term, as these events would be short-lived. Wildfires are by nature unplanned, and while we can account for these emissions, it should be noted that these emissions may be prevented (by the increase in prescribed burning), or the impacts could be less with faster response time. Eglin NRS may receive four more fire fighters as a result of the 2005 BRAC decisions.

Greenhouse Gases from Wildfires

Wildfires tend to be more intense than prescribed fires because they typically do not start under optimal weather conditions. The Eglin NRS has significantly reduced the threat of wildfire at Eglin AFB by prescribed fire and forest management activities. Without these programs, the emissions of GHGs from wildfires would be significantly higher. Table 3-11 demonstrates the GHG emissions for 17,000 acres burned by wildfire projected under the proposed action. The total emissions of CO₂e are approximately 269,000 tons/year (244,000 metric tons/year). If the acreage were treated with prescribed fire (hence preventing the wildfires) total CO₂e emissions would be approximately 90,000 tons/year providing 179,000 tons of CO₂e reduction annually.

Table 3-11. Annual Greenhouse Gases from Wildfire Under the Proposed Action

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Wildfires	244,953	13,173	10,909	269,035

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions Equipment/vehicle emissions

Equipment/vehicle emissions related to Wildfires

The equipment used in the event of a wildfire is similar to that used for prescribed burning activities without the ignition equipment (ATVs and Helicopter). The emissions are thus slightly smaller, and are shown in Table 3-12. Emissions from these activities are insignificant and necessary in order to manage a wildfire.

Table 3-12. Proposed Action - Criteria Pollutant Emissions from Wildfire Support Equipment

Emissions by Equipment	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Tractor	0.02	0.08	0.02	0.03	0.00
Fire Engines	0.02	0.02	0.08	0.00	0.01
Tractor Transport Truck	0.02	0.02	0.08	0.00	0.01
Total	0.06	0.11	0.18	0.03	0.03

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound

Equipment/vehicle Emissions associated with Equipment/vehicle related to Wildfires

Greenhouses gases as a result of managing wildfires on Eglin are shown in Table 3-13. They are minimal and necessary in order to manage a wildfire.

Table 3-13. Proposed Action - Greenhouse Gas Emissions from Equipment Used During Wildfires

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Wildfires	88	0	0	88
Total	88	0	0	88

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Forest Management

Forest management activities include timber management, reforestation and habitat restoration. Equipment used to support these activities includes pickup trucks and land clearing/logging equipment (loader, skidder, feller buncher). Emissions from herbicides used would not be significant assuming proper regulations and guidelines are followed during mixing and application. Table 3-14 shows the emissions of pollutants from these activities. They are a small percentage of the whole 3-county region, and therefore no adverse impacts are expected.

Table 3-14. Proposed Action - Criteria Pollutant Emissions from Forest Management Activities Compared to the County Emissions

Activity	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Siting Equipment	0.46	0.03	0.16	0.00	0.04
Clearing Equipment	1.31	3.03	0.70	1.11	0.23
Planting Activities	0.33	0.02	0.12	0.00	0.03
Total	2.10	3.08	0.98	1.11	0.30

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound;

Table 3-15 shows the concentrations of pollutants due to forest management activities. All pollutants are well below the national standards and no adverse impacts are expected.

Table 3-15. Proposed Action - Air Emissions from Equipment Use in Support of Forest Management Activities Compared to the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	4.655E-07
	8-Hour	9	3.258E-07
NO _x	Annual	0.053	3.318E-08
SO ₂	3-Hour	0.5	7.107E-08
	24-Hour	0.14	3.158E-08
	Annual	0.03	6.317E-09
PM ₁₀	24-Hour	150 µg/m ³	1.055E-04
	Annual	50 µg/m ³	2.110E-05

ppm = parts per million; CO = Carbon Monoxide; µg/m³ = micrograms per cubic meter; NO_x = Nitrogen Oxides; PM = Particulate Matter; SO₂ = Sulfur Dioxide; VOC = Volatile Organic Compound

Greenhouse Gases related to Forest Management

Table 3-16 shows the concentrations of GHGs due to forest management activities. The emissions of GHGs from the equipment used to manage the forest are small. The benefit of increased carbon storage from restoration and planting make these emissions insignificant.

Table 3-16. Proposed Action - Greenhouse Gas Emissions from Equipment Used During Forest Management Activities

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Siting Equipment	167	0.1	0.4	168
Clearing Equipment	969	0.8	2.4	972
Planting Activities	169	0.1	0.4	170
Total	1,305	1.1	3.3	1,310

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Green house Gases-Carbon sequestration

Forest management, in particular habitat restoration and planting activities increase the amount of carbon in storage. These activities are planned to increase under the proposed action. Currently, over 70% of Eglin is available for carbon storage. Approximately 315,000 acres is wooded, and another 60,800 acres are wetlands (U.S. Air Force, 2011d). Research on carbon storage is ongoing, but the EPA estimates that an average tree sequesters 1 metric ton of CO₂/acre/year (USEPA, 2011c), and according to research by the Upper Mississippi River Sub-basin Hypoxia Nutrient Committee, wetlands uptake about 0.6 tons of carbon/acre/year (UMRSHNC, 2008).

Using these figures, approximately 385,000 tons of CO₂ (349,000 metric tons) are sequestered each year by the Eglin forest and wetlands. Under the proposed action, with increased habitat restoration and planting planned, this can only increase.

3.1.2.2 No Action Alternative

Prescribed Fire Emissions

Under the No Action Alternative, criteria pollutant emissions from prescribed burning are similar to the Proposed Action (Table 3-17). The largest contributor to local air quality is PM.

Table 3-17. No Action Alternative - Criteria Pollutant Emissions from Prescribed Burning Compared to the County Emissions

Activity	Emissions (tons/yr)			
	CO	NO _x	PM	VOC
Prescribed Burning	34,776	766	5,132	709
Total ROI Emissions	235,139	25,098	22,073	5,483
% of ROI	14.8%	3.1%	23.3%	12.9%

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound; ROI = Region of Influence

Greenhouse Gases related to Prescribed Fire

Under the No Action Alternative, 120 prescribed burns treated approximately 86,000 acres. The emissions from these fires are shown in Table 3-18. They are similar to emissions under the proposed action.

Table 3-18. Annual Greenhouse Gases from Prescribed Fire under the No Action Alternative

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Prescribed Burning	413,058	22,214	18,395	453,667

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Equipment/vehicle Emissions related to Prescribed Fire

Under the No Action Alternative, 120 prescribed burns treated approximately 86,000 acres. The criteria pollutant emissions are shown in Table 3-19. The GHG emissions from equipment used to manage those burns are shown in Table 3-20. Emissions of both criteria pollutants and GHGs are similar to emissions under the Proposed Action.

Table 3-19. Emissions of Criteria Pollutants from Prescribed Fire Support Equipment Compared to the County Emissions

Emissions by Equipment	Emissions (tons/yr)				
	CO	NO _x	PM	SO _x	VOC
Tractor	0.02	0.06	0.01	0.02	0.00
ATVs	4.46	0.04	0.01	0.00	0.46
Fire Engines	0.03	0.02	0.12	0.00	0.02
Tractor Transport Truck	0.02	0.01	0.06	0.00	0.01
Pickup Truck	0.15	0.01	0.05	0.00	0.01
Helicopter ¹					
Ground Idle	0.25	0.03	0.00	0.00	0.09
Flight Idle	0.26	0.03	0.00	0.00	0.07
Cruise	0.27	0.50	0.00	0.00	0.02
Total	5.45	0.69	0.26	0.03	0.68

CO = Carbon Monoxide; NO_x = Nitrogen Oxides; PM = Particulate Matter; VOC = Volatile Organic Compound; ROI = Region of Influence

¹ A UH-1 Helicopter was used as a proxy;

Table 3-20. No Action Alternative - Greenhouse Gas Emissions from Equipment Used During Prescribed Burns

Activity	Emissions (tons/yr)			
	CO ₂	CH ₄ e	N ₂ Oe	Total CO ₂ e
Prescribed Burning	560	0	1	562
Total	560	0	1	562

CO₂ = Carbon Dioxide; CH₄e = Methane in CO₂ equivalent; N₂Oe = Nitrous Oxide in CO₂ equivalent; CO₂e = Total carbon dioxide equivalent emissions

Wildfire Support

Wildfire emissions

Fire emissions of criteria pollutants under the No Action would be similar to the Proposed Action, with a slight increase since there would be fewer personnel to quickly control wildfires.

Greenhouse Gases related to Wildfire

Greenhouse gas emissions are similar to emissions under the proposed action.

Equipment/vehicle Emissions related to Wildfire Management

Emissions under the no action alternative of both criteria pollutants and GHGs are the same as under the proposed action.

Forest Management

Equipment/vehicle Emissions

Emissions under the no action alternative of both criteria pollutants and GHGs are the same as under the proposed action.

3.2 SOILS

3.2.1 Affected Environment

Soils refer to unconsolidated materials formed from the underlying bedrock or other parent material. Soil is produced by forces of weathering and soil formation acting on parent material. The main processes of soil formation are accumulation of organic matter, leaching of calcium carbonate, reduction of iron, and the reduction of silicate clay minerals. If all of these processes do not occur, the resulting matrix is then referred to as sediment. Soil formation is an on-going process that is determined by the nature of the parent material and influenced by environmental factors such as climate, geology, topography, and vegetation. The soils on Eglin AFB have developed from the Citronelle Formation as well as alluvium (gravel, sand, silt, and clay deposited by water) from the floodplains of lowland areas. These soils on Eglin AFB are called soil associations that are groups of soil series (soils with similar profiles) that share common characteristics and are associated geographically (Overing et al., 1995; Weeks et al., 1980; U.S. Air Force, 2008).

The majority of soils on Eglin AFB belong to the Lakeland Association (Figure 3-3). These are excessively drained, brownish-yellow sands that have developed along broad ridgetops and slopes. Typically, they have sandy surface layers with sandy subsoils that are more than 80 inches deep. Lakeland soils are typically associated with Chipley, Dorovan, Foxworth, and Troup soils. Only the Dorovan soils have a high degree of organic content; thus they are considered mucks. Lakeland sands vary in acidity from medium to very strong. Soil colors vary a fair amount. They range in color from dark, grayish brown to brownish-yellow to yellowish-brown. Table 3-21 lists additional soils that are represented on Eglin AFB. For comparative purposes, the primary soils are also listed (Overing et al, 1995; Weeks et al, 1980; U.S. Air Force, 2008).

Dorovan-Pamlico mucks are the second most abundant soils found on Eglin AFB. These mucks are composed of more than 20 percent organic material that is highly decomposed. They are very poorly drained and strongly acidic. Water is usually at or near the surface for nine months or more each year. About 60 percent of this association is made up of Dorovan soils, which have organic material that is more than 40 inches deep. The Pamlico soils make up about 25 percent and have soils that are 20 to 40 inches deep (U.S. Air Force, 2008).

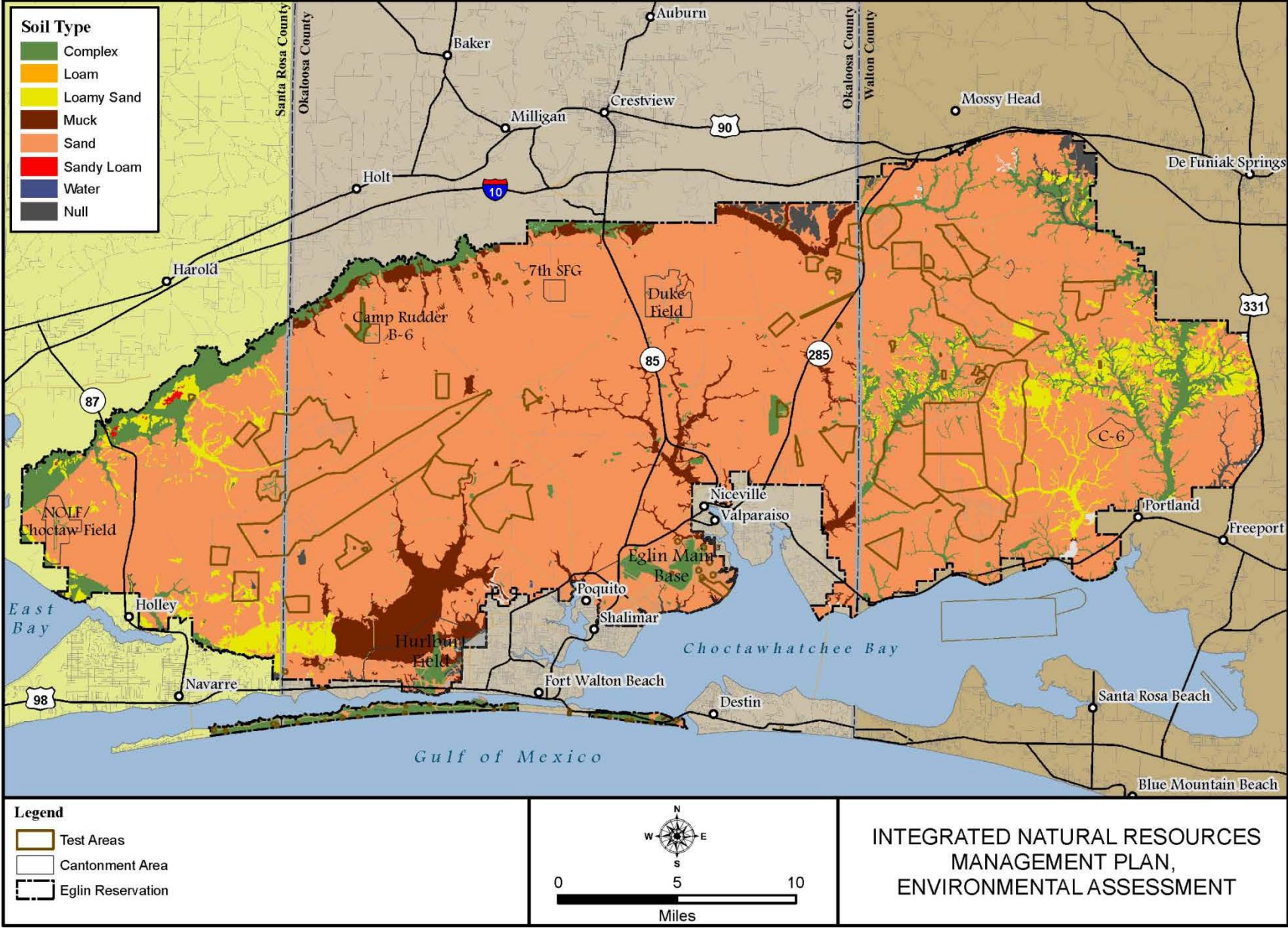


Figure 3-3. Soil Types of Eglin AFB

Table 3-21. Soil Types and Characteristics Represented on Eglin AFB

Soil Name	Erosion Risk	Attributes	Soil Type
Lakeland Sand	Moderate to high	Yellowish brown to grayish brown	Sand
Johns Fine Sandy Loam	Moderate	Very fine grained interspersed with thick loam	Sandy Loam
Rutledge Loamy Sand	Low	Ponding, very acidic, clayey	Loamy Sand
Troup Loamy Sand	Low to moderate	Unconsolidated marine sediments, brown loam	Loamy Sand
Dorovan-Pamlico Association	Very low	Highly organic	Muck
Fuquay Loamy Sand	Low	Very acidic, ironstone nodules	Loamy Sand
Leon Sand	High to low	Marine-based sediments, can be mucky	Sand
Urban Land	Low	Natural soil not observed	Variable
Pactolus Loamy Sand	Low	Thick, deep soils, very acidic	Loamy Sand
Bibb-Kinston Association	Very low	Dark concretions, gravel, high organics	Silt Loam
Udorthents	Low	Excavated pits, low fertility	Silt Loam
Rutledge Sand	High	Very acidic, slow runoff	Sand
Troup Sand	Moderate	Unconsolidated marine sands	Sand
Dorovan Muck	Low	Highly organic	Muck
Foxworth Sand	Moderate	Very acidic	Sand
Chipley and Hurricane	Moderate	Moderately acidic	Sand
Bonifay Loamy Sand	Low	Very acidic, ironstone pebbles	Loamy sand

Overing et al, 1995; Weeks et al, 1980; U.S. Air Force 2008

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Prescribed Fire

No adverse impacts to landforms and soils are anticipated from prescribed fire activities under the Proposed Action if management practices are followed. Fireline construction is an integral component of prescribed burning. Firelines can result in erosion and water quality degradation. Lines plowed in wetlands can also result in excessive drainage and possibly damage to wetlands. Precautions are necessary when constructing firelines near surface waters and wetlands (FDOACS, 2011). The following BMPs have been developed to mitigate impacts from firebreaks (FDOACS, 2011):

- Construct firelines only where necessary, making use of existing barriers such as roads, water bodies, etc.
- Where possible, use alternatives to plowed lines such as harrowing, foam lines, wet lines or permanent grass.
- Do not plow lines through sensitive areas such as wetlands, marshes, prairies and savannas unless absolutely necessary. Avoid these areas or use alternative line construction methods.
- Maintain minimum plow depth at all times.
- When crossing water bodies, raise the equipment to prevent connecting the line directly to the water body.

- Do not construct firelines which act as drainage systems, particularly those that might connect or drain isolated wetlands.
- Avoid constructing plowed firelines in the Special Management Zone, particularly the Primary Zone.
- Use water bars, turnouts and/or vegetation to stabilize firelines when erosion and sedimentation might otherwise result.
- When re-vegetating firelines, use native species when possible.
- Orient firelines along the contour wherever possible to prevent erosion and gullyng.
- Do not prescribe burn for site preparation purposes within the Special Management Zone when the slope of the site is 18% or greater (Site Sensitivity Classes [SSCs] 5 and 6).

When vegetation is cleared, rainfall events can cause water to move across non-vegetated surfaces and transport soils into local water bodies. Prevention of this transport, through minimizing ground disturbances during plow line construction, in addition to providing erosion minimization measures such as BMPs, can help prevent the transport of sediments.

Wildfire Support

No adverse impacts to landforms and soils are anticipated from wildfire support activities under the Proposed Action if management practices are followed. The creation of plow lines during wildfire suppression activities creates soil disturbance, which has the potential to cause erosion in these areas. Wildfire support personnel would follow the same requirements as above for Prescribed Fire to minimize erosion potential.

The management guidelines concerning the creation of fire plow lines greatly minimize the potential for soil erosion into wetlands and waterways. The rehabilitation of any plow lines potentially causing soil erosion is an excellent measure to reduce negative impacts. The creation of plow lines within 50 feet of waterways may cause soil erosion if performed on a steep slope. Florida Division of Forestry calls a 300-foot zone around waterways a “discretionary” zone where care must be taken to prevent erosion. It is extremely critical that re-vegetation of these zones is performed.

Forest Management

Minimal adverse impacts to landforms and soils are anticipated from Forest Management activities under the Proposed Action if management practices are followed. Timber harvesting and mechanical site preparation forestry activities have the most potential for soil disturbance. Timber harvesting and site preparation techniques conducted on flat surfaces have little impact on water quality since there is small potential for movement of soil during rainfall. However, any forestry operations conducted on a steep slope can disrupt the soil and cause excessive erosion during a heavy rainfall. The type of soil in combination with the steepness of terrain defines the erosion potential. Careful timber removal and care in all forestry operations can reduce the erosion potential through the use of developed Best Management Practices (BMPs) (U.S. Air Force, 2008). Eglin follows the Silviculture BMPs for Florida (FDOACS, 2011).

Skid Trails

- Locate skid trails along the contour whenever practical to promote re-vegetation and reduce soil erosion. If skidding must be done up or down the slope, the operator should skid uphill and avoid long, continuous skid trails.
- After skidding activities are complete, stabilize skid trails where necessary by installing water bars or similar structures at recommended intervals - seeding and fertilizing skid trails will accelerate stabilization on erodible soils and/or steep slopes.
- When skidding in muck or peat (organic) soils such as in swamps, bogs or similar wetlands, concentrate skidding to as few trails as possible - this will confine soil compaction to small areas.
- When skidding on mineral soils, such as in uplands, skidding should be dispersed so that soil compaction is minimal even in individual trails.
- Keep main skid trails out of all Special Management Zones except to approach a designated crossing.
- Keep loading decks or landings out of all Special Management Zones. In addition, keep all log bunching points out of the Primary Zone of the SMZ.

Slash Disposal

- Logging slash, such as tops and limbs, which are incidental to timber harvesting activities, may be left in place, as long as such material is not left in a water body.
- Remove logging slash from all water bodies including both intermittent and perennial streams, lakes and sinkholes.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes, sinkholes or similar water resource features.

Site Preparation and Planting

- Plan site preparation and planting procedures prior to timber harvesting activities.
- Select only the site preparation techniques that are necessary to establish seedlings and minimize vegetative competition - do not needlessly disturb the ground surface or expose the topsoil.
- Do not conduct mechanical site preparation within any part of the Special Management Zone.
- Do not conduct intensive mechanical site preparation such as bedding, raking and windrowing in wetlands.
- When chopping, pull chopper perpendicular to a water body to orient soil indentations along the contour (not necessary if chopping is followed by bedding or if the water body is separated from the chopped area by windrows or a similar barrier to overland flow).
- Arrange windrows and soil beds parallel to a water body or wetland in order to provide a barrier to overland flow prevent concentration of runoff and reduce erosion.

- When using a blade to shear, push, or pile debris, keep the blade above the soil surface. This will minimize erosion and facilitate rapid site recovery and tree growth.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes or similar water resource features.
- Do not conduct site preparation burning within the SMZ where slopes are 18% or greater.

Habitat Restoration

Beneficial impacts to landforms and soils are anticipated from erosion control restoration activities under the Proposed Action if management practices are followed. Erosion control actions may involve small-scale activities such as planting vegetation or reseeding areas along stream banks or, in some cases, large-scale activities such as reforming landscapes in barren areas to smooth out large gullies, followed by replanting/reseeding to reduce overland flow from storm events and subsequent erosion. Many of these erosion control activities are conducted along or near stream banks to mitigate the movement of sediments into surface waters, which is considered a non-point source of water pollution. Activities of this nature are meant to conserve soil resources and associated habitats. As a result, continued erosion control activities, while perhaps having short-term, temporary impacts to water quality in these areas resulting from the use of heavy equipment, would have long-term beneficial impacts to the landforms and soils of Eglin.

3.2.2.2 No Action Alternative

Prescribed Fire

Under the No Action Alternative, prescribed fire activities would have minimal adverse impacts to landforms and soils with the implementation of BMPs (as presented in the Proposed Action).

Wildfire Support

Potential impacts to landforms and soils from wildfire support activities under the No Action Alternative would be the same as those described under the Proposed Action.

Forest Management

As described under the Proposed Action, the use of established BMPs would serve to minimize the potential for impact under the No Action Alternative. As a result, while there may be some minor, localized impacts to soils due to ground disturbance, there would be an overall benefit to the landforms and soils of Eglin as a result of forestry activities on the reservation.

Habitat Restoration

Potential impacts to landforms and soils from habitat restoration activities under the No Action Alternative would be the same as those described under the Proposed Action.

3.3 WATER RESOURCES (SURFACE WATERS, WETLANDS, FLOODPLAINS)

Groundwater

Groundwater is defined by the U.S. Geological Survey (USGS) as “water that flows or seeps downward and saturates soil or rock, supplying springs and wells” (USGS, 2011). A deposit of subsurface water that is large enough to tap via a well is referred to as an aquifer.

Surface Water

Surface water is defined as any water on Earth’s surface and includes lakes, rivers, and streams (USGS, 2011). Surface waters are important for a variety of reasons including economic, ecological, recreational, and human health. Surface waters have the potential to be impacted by land clearing and construction activities.

Wetlands

Wetlands are defined in the USACE Wetlands Delineation Manual as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas” (USACE, 1987). The majority of jurisdictional wetlands (wetlands that fall under state or federal regulatory authority) in the United States are described using the three wetland delineation criteria: hydrophytic vegetation, hydric soils, and hydrology (USACE, 1987).

Floodplains

Floodplains are lowland areas adjacent to surface water bodies (e.g., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Federal actions occurring within floodzones require a finding of no practical alternative (FONPA). Floodplains are biologically unique and are also highly diverse ecosystems that provide a rich diversity of aquatic and terrestrial species, acting as a functional part of natural systems (Mitsch and Gosselink, 2000).

Coastal Zone

The CZMA provides for the effective, beneficial use, protection, and development of the U.S. coastal zone. Under the CZMA the term “coastal zone” is defined as coastal waters and adjacent shore lands strongly influenced by each other and in proximity to the several coastal states, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The landward boundaries of the state of Florida are defined by the state, in accordance with Section 306(d)(2)(A) of the CZMA, as the entire state of Florida. Since all of Florida is within the coastal zone as defined by the CZMA and Florida’s Coastal Management Program, all of the potentially affected resources discussed and analyzed in this chapter are coastal resources (FDEP, 2011).

Stormwater

Stormwater refers to water originating from precipitation events that flows over land or impervious surface and is not absorbed in to the soil or ground. Stormwater can adversely affect water quality, aquatic habitats, the hydrologic characteristics of streams and wetlands, and can increase flooding. Land-disturbing activities such as clearing and grading could result in increases in stormwater runoff (FDEP, 2008).

3.3.1 Affected Environment

This section describes the water resources that could be potentially affected by the Proposed Action or No Action Alternative.

Groundwater

The surficial aquifer, also known as the sand and gravel aquifer, and the Floridan aquifer are the two underlying aquifers from which Eglin AFB withdraws potable and nonpotable water supply. The sand and gravel aquifer is a generally unconfined, near-surface unit separated from the underlying confined Floridan aquifer by the low-permeability Pensacola Clay confining bed. The sand and gravel aquifer is mainly composed of clean, fine-to-coarse sand and gravel, while the Floridan aquifer consists of a thick sequence of inter-bedded limestone and dolomite. Water quality of the sand and gravel aquifer is generally good, but it is vulnerable to contamination from surface pollutants due to its proximity to the ground surface (U.S. Air Force, 2003a). Water from the sand and gravel aquifer is not a primary source for domestic or public water supply on Eglin because of the higher quality water available from the underlying upper limestone of the Floridan aquifer. There are no drinking water wells on SRI. Water quality of water drawn from the upper limestone of the Floridan aquifer is of suitable quality for most uses, and is the primary source of water used at Eglin AFB. The top of the aquifer is about 50 feet below mean sea level (MSL) in the northeast corner of the base and increases to about 700 feet below MSL in the southwestern area of the base (McKinnon and Pratt, 1998). The wells on Eglin tap into both the surficial and Floridan aquifers and are used for both potable and non-potable supply.

Increasing concerns about the existing and anticipated water supply from the Floridan Aquifer has resulted in the designation of the coastal areas of Region II, south of Eglin AFB in Santa Rosa, Okaloosa and Walton Counties, as a Water Resource Caution Area (WRCA). The designation WRCA by the (Northwest Florida Water Management District (NFWFMD)) requires withdrawal permittees to implement water conservation measures and maximize their water use efficiency. In addition, permittees in the WRCA are subject to increased water use reporting requirements. The designation of WRCA also prohibits the use of the Floridan Aquifer for nonpotable purposes (NFWFMD, 2008). At Eglin AFB, the Floridan Aquifer is used extensively for drinking water while only small amounts are withdrawn from the Sand and Gravel Aquifer. The Sand and Gravel Aquifer provide an alternative source for nonpotable uses at Eglin AFB and.

At Cape San Blas (CSB), there are three aquifers from which fresh water may be obtained: the surficial aquifer, the intermediate confining unit, and the Floridan aquifer. The surficial aquifer system at CSB is recharged through direct infiltration of rainwater, and consists of a relatively

narrow band of unconfined waters moving through undifferentiated sand and clay sediments. Below the surficial aquifer is the intermediate confining unit, an aquifer that is confined within sediments, and as such is not prone to vertical movement. The Floridan aquifer is the most important of the three aquifers in terms of volume and quality of water. It supplies the majority of domestic, urban, and agriculture water used in Gulf County. The top of the Floridan aquifer is approximately 500 feet MSL under CSB. Sampling by Lamont and others indicates that the surficial water table at CSB is not influenced by saltwater intrusion (Lamont et al., 1997). There is one drinking water well located on Eglin property at CSB.

Surface Water

The main Eglin reservation encompasses portions of three hydrologic basins, including Choctawhatchee Bay, Yellow River Basin, and Pensacola Bay. CSB is located in the St. Andrew-St. Joseph Bays watershed. Surface water in these basins is extensive; Eglin AFB includes 32 lakes (over 300 acres of man-made ponds and natural lakes), 30 miles of rivers, an extensive stream network covering approximately 600 acres of the base, 20 miles of Gulf of Mexico shoreline, and it is adjacent to several estuarine bays along the Gulf of Mexico (U.S. Air Force, 2003a).

Natural primary channels and secondary tributaries in the northern section of Eglin drain to the Yellow River; while the primary channels and tributaries in the south and eastern section drain to Choctawhatchee Bay.

Most of the streams on Eglin are classified as seepage streams or blackwater streams. One spring-fed stream, Blue Spring Creek in Okaloosa County, originates from a deep artesian spring. Seepage streams are clear to lightly-colored, relatively short, shallow, and narrow water courses originating from shallow ground waters that have percolated through deep, sandy, upland soils. Unique types of seepage streams, called steephead streams, are characterized by steep slopes terminating in amphitheater-like ravines where the spring flow originates, and has plants and animals more typical of Appalachian mountain areas. Blackwater streams are steep-banked streams that characteristically have tea-colored waters laden with tannins, particulates, and dissolved organic matter and iron from swamps and marshes that feed into the streams. Most of the ponds on Eglin are man-made impoundments, resulting from the backup of water behind small dams built on streams. Eglin has both permanent and temporarily inundated wetlands, some of which contain herbaceous or woody vegetation. The bays adjacent to Eglin are brackish, with many of them supporting shellfish populations and beds of submerged aquatic vegetation.

Several water bodies on or adjacent to Eglin have been defined as Outstanding Florida Waters (Florida Administrative Code [FAC] 62-302.700) because they have exceptional recreational or ecological significance. It is the FDEP's policy to afford the highest protection to Outstanding Florida Waters, which are listed below.

- Fred Gannon Rocky Bayou State Recreational Area
- Basin Bayou State Recreation Area
- Gulf Islands National Seashore

- Rocky Bayou State Aquatic Preserve
- St. Joseph Bay Aquatic Preserve
- Yellow River Marsh Aquatic Preserve
- Shoal River

At Eglin AFB, several water segments (Choctawhatchee Bay, East Bay River, St. Joseph Bay, Rocky Bayou, Poquito Bayou, Boggy Bayou, lower Yellow River) have been 303(d) listed by FDEP for turbidity, bacteria, dissolved oxygen, or nutrients (USEPA, 2011d) under the Federal Water Pollution Control Act (FWPCA).

Turbidity in the Yellow River and East Bay River is likely due to the numerous unpaved roads in the watersheds. Eglin has a very active erosion control program that is currently investing substantial resources into these watersheds.

The other impaired water segments receive stormwater from Eglin's urban areas, not necessarily the reservation. Bacteria, turbidity, low dissolved oxygen and nutrient loading are indicative of urban stormwater runoff.

No well developed drainage exists on SRI, but numerous coves and inlets may be found along the northern edge of the island. There are brackish ponds and many other small wetlands. Surface water runoff drains into Choctawhatchee Bay, Santa Rosa Sound, and the Gulf of Mexico.

Cape San Blas is located in the St. Andrew-St. Joseph Bays watershed. The only surface waters present are two small brackish coastal ponds at its point. Based on topography, surface water either drains south into the Gulf of Mexico, or north into St. Joseph Bay.

The NRS works closely with the 96 CEG/CEVCE (Environmental Engineering Section) in water quality and wetland management. The Environmental Engineering Section provides support and guidance to the NRS regarding policy and permits for specific environmental programs, including Section 401 and 404 of the CWA.

Wetlands

Wetlands are among the most productive ecosystems in the world providing food and shelter for many different species. Wetlands also provide a host of ecologically important functions such as groundwater recharge, flood control, shoreline protection, and watershed protection. The National Wetlands Inventory (NWI) Classification for Wetlands (USFWS, 1992) describes wetland habitats based on factors such as hydrologic and geomorphic features, and chemical and biological characteristics. Cumulatively, the Eglin reservation, SRI and CSB support all five of the wetland categories in the NWI classification system:

- *Estuarine* - Deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the ocean, with ocean water at least occasionally diluted by freshwater runoff from the land. The upstream and landward limit is where ocean derived salts measure less than .5 parts per

thousand (ppt) during the period of average annual low flow. The seaward limit is 1) an imaginary line closing the mouth of a river, bay, or sound, and 2) the seaward limit of wetland emergents, shrubs, or trees when not included in 1).

- *Riverine* - All wetlands and deepwater habitats contained within a channel except those wetlands 1) dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and 2) which have habitats with ocean-derived salinities in excess of .5 ppt. Only Eglin reservation has riverine acreage.
- *Lacustrine* - Wetlands and deepwater habitats 1) situated in a topographic depression or dammed river channel, 2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30 percent area coverage, and 3) whose total area exceeds eight hectares (20 acres), or area less than eight hectares if the boundary is active wave-formed or bedrock or if water depth in the deepest part of the basin exceeds 2 meters (m) (6.6 feet) at low water. Ocean-derived salinities are always less than .5 parts per trillion (ppt).
- *Palustrine* - All nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such tidal wetlands where ocean-derived salinities are below .5 ppt. This category also includes wetlands lacking such vegetation but with all of the following characteristics: 1) area less than eight hectares, 2) lacking an active wave-formed or bedrock boundary, 3) water depth in the deepest part of the basin less than two meters (6.6 feet) at low water, and 4) ocean-derived salinities less than .5 ppt.
- *Marine* - Open ocean, overlying the continental shelf and coastline exposed to waves and currents of the open ocean shoreward to 1) extreme high water of spring tides, 2) seaward limit of wetland emergent vegetation, trees, or shrubs, or 3) the seaward limit of the estuarine system, other than vegetation. Salinities exceed 30 ppt.

96 CEG/CEVCE (Environmental Engineering Service) is the established point of contact (POC) for all regulatory issues involving wetland resources. The Environmental Engineering Section provides support and guidance to the Natural Resource Service (NRS) regarding policy and permits for specific environmental programs, including Section 401 and 404 of the CWA. Any areas recently surveyed for wetlands by NRS (and approved by federal/state regulatory agencies) are entered into Eglin's GIS to aid in future land use management.

Floodplains

Floodplain management on Eglin AFB includes floodplain protection (Executive Order [EO] 11988), floodplain boundary determination, and assessment of proposed actions within floodplains. Floodplain protection and assessment of proposed actions is the responsibility of the Environmental Impact Analysis Program, 96th Civil Engineer Group, Environmental Analysis Section (96 CEG/CEVSP) and the NRS. Federal actions occurring within flood zones require a finding of no practical alternative (FONPA). Floodplain boundary maps are housed in the Geographical Information System (GIS) database (Eglin Enterprise Spatial Database [EESD]).

Flooding on Eglin AFB is caused by rainfall, hurricane storm surge, or a combination of both. Annual rainfall averages 60 inches, primarily in the summer and late winter or early spring. Most of the summer rainfall is from scattered showers and thundershowers that are often heavy and last only one or two hours. Excessive rainfall may also result from hurricanes or tropical

storms, with most storms occurring late summer and early fall. This area has a drought return interval of 20-25 years.

The majority of the Reservation is above the 100-year flood zone; however, extensive flood-prone areas occur along the Yellow River drainage system and the East Bay Swamp. The perennial streams on Eglin AFB are included within areas that are likely to be inundated by 100-year floods. The majority of CSB is within the 100-year flood inundation area.

Stormwater

Stormwater is not a water resource but the product of rainfall running over the affected environment. NRS management defers compliance issues involving stormwater to the 96 CEG/CEVCE (Environmental Engineering) within the affected environment. NRS management would comply with regulatory requirements determined by Environmental Engineering.

3.3.2 Environmental Consequences

In this section, management activities for Proposed Action and the No Action alternative are evaluated for potential impact to the affected environment's water resources. Proposed management activities that have been identified as having potential adverse impacts on water resources are compared between the 2012 INRMP (Proposed Action) and the 2008 INRMP (No Action alternative).

3.3.2.1 Proposed Action

Wildfire Support

The Proposed Action would minimize potential impact of Wildfire Support activity to surface water, wetlands, and floodplains. The Proposed Action activities would continue the construction and use (or re-use) of plow lines, in emergency situations, for wildfire suppression near surface water, wetlands or floodplains. The heavy equipment used in this activity could cause erosion near streams and transport sediment to surface water, increasing turbidity. With the high incidence of wildfires caused by military missions on the Eglin reservation, emergency response to suppress fires would likely not decrease, except in UXO areas that are designated "no suppression zones or restricted suppression zones. NRS would minimize impacts to water resources by following its policy for no plowing in biologically sensitive areas, or within 100 ft of streams or in wetlands (Table 3-23) unless deemed necessary in emergency situations. If needed, then restoration of the areas is done.

Forest Management

The Proposed Action would continue forestry operations such as clearing, site-prep and tree planting to achieve timber removal, reforestation, and native understory restoration. Potential for erosion at disturbed sites and the potential for short-term impacts surface water would be minimized by implementing the following practices in the Forestry Management Component Plan:

- NRS managers implement Florida's Best Management Practice for Silviculture (FDOA, 2011) in all forestry operations, and the manual is included in the Forestry Management Component Plan.
- Commercial contractors retained to harvest timber on the Eglin Reservation are monitored by NRS for site prep/tree removal regulatory and best management compliance.

Pesticide and herbicide application is a common management technique in some areas of Florida. Pesticides are usually applied near tree planting time or shortly after. Eglin currently has an application program with guidelines for use of herbicide and pesticides on Eglin AFB property (U.S. Air Force, 2008). These chemicals generally do not pose a threat to water quality as long as they are applied according to the label and in compliance with the following BMPs (FDOACS, 2011):

- Choose equipment that directs the chemical only to the target area. Misdirected or excessive amounts of pesticides are wasteful, expensive and can pose a serious threat to water quality and aquatic life.
- Do not conduct aerial application, mist blowing or operational application of pesticides within the Primary Zone of the SMZ, including any drift from nearby applications.
- Do not leave pesticide containers on site - these should be rinsed and disposed of according to the directions on the label.
- Do not rinse spray equipment or discharge rinse water in water bodies, wetlands or within the Special Management Zone.

Habitat Restoration

Proposed Action activities for habitat restoration may have short-term impacts to surface water resources with continued management methods, however adverse impacts to water resources are not anticipated. The Proposed Action would continue to restore stream habitats by removing culverts (or replacing with appropriately sized culverts) and earth-moving activities that would require heavy equipment and would expected to have short term impacts (associated with erosion) on water resources. However, restored drainage function and habitat improvement in Okaloosa Darter Streams have demonstrated the positive benefits on water resources (stream restoration). Disturbed stream banks would be re-vegetated in accordance with practices detailed in the Erosion Control Plan.

The Proposed Action would also continue to use herbicide application for invasive plant control in affected areas that have potential for transport to surface or groundwater. The three herbicides that have been used (2,4-dichlorophenoxyacetic acid [2,4-D], Rodeo, and Rotenone) are DoD and EPA approved, and range from slightly toxic to non-toxic to fish and aquatic invertebrates. To minimize the potential for impacts to non-target resources, herbicides are used in accordance with requirements from the Long-term Vegetation Control EA. Eglin-specific application rates for hexazinone (used in RCW habitat to control invasive hardwoods) would be restricted from wetlands and riparian areas. Mitigation activities such as vegetative stream buffers would be used to prevent/reduce overland chemical transport.

Recreation Management

Recreation management may have negative impacts on aquatic habitats, primarily when the public overuses an area or conducts unauthorized activities in sensitive areas (i.e., off-road driving). Recreation management occurs across all of the open portions of the Eglin Complex on the mainland, SRI, and CSB, including certain wetland/riparian areas. High use areas such as the public access beach, designated recreation areas, and stream access points may suffer from impacts such as vegetation disturbance and erosion. The NRS works to address the potential for these issues by posting and fencing sensitive habitats in many of these areas, including designated access points on SRI and established canoe launches on popular creeks. If problem areas are found, the NRS typically installs pole-and-cable barriers to limit access and allow areas to recover. Motorized off-road recreational vehicles (all-terrain vehicles, dirt bikes) would continue to be prohibited throughout the reservation and SRI to prevent habitat destruction and erosion by tire rutting.

Runoff impacts from food plots are unlikely because food plots would not be established within riparian buffers, and any runoff would be short-term as vegetation is quickly established in the food plots. Several ponds for public fishing would allow the use of small boats without gasoline motors. Pond spillways are scheduled for maintenance at a rate of one per year, to prevent nutrient rich pond water from overflowing to near or downstream surface water. Weed control measures would be followed by NRS managers for specific application guidelines for DoD approved herbicides (mentioned also in Section 3.7).

Overall, recreation management would not significantly impact water resources. Invasive Non-native and Nuisance Animal Species Management

The Proposed Action activities for feral hog trapping and removal may reduce potential adverse effects to water resources in the affected environment. The Proposed Action would continue monitoring and using trapping methods in the Invasive Non-native Wildlife, Feral Animals, and Nuisance Native Wildlife Operational Plan that would potentially reduce impact to surface and groundwater resources by feral hogs. Feral Hogs, over decades, have invaded sensitive areas of the Eglin Reservation. NRS managers are concerned mostly with foraging in the bottoms of steephead ravines and seepage slope areas. Hog foraging activity has damage these uniquely vegetated habitats and can change the hydrology of the soil they trample. Live stock waste is also a common source for harmful bacteria (fecal coliforms). Several water segments within the Eglin reservation (in the Choctawhatchee Watershed) have been 303(d) listed by FDEP for fecal coliform contamination (FDEP, 2010). The feral hogs are only one source of bacteria, but their proximity to surface and groundwater resources increases the potential for adverse impacts to water resources. Therefore, Eglin feral hog control efforts help reduce potential fecal coliform contamination.

Protected Species Monitoring and Management

The Proposed Action would continue activities for removal of non-native, invasive hardwood species and management of the wetland habitat of the flatwoods salamander which is a protected species. Concerns using herbicides for invasive plant removal in wetlands were also addressed in Section 3.7, and management would anticipate short-term impacts to surface and groundwater. However, NRS managers would follow manufacturer application methods and rates described in

the Long-term Vegetation Control (LVC) Environmental Assessment (U.S. Air Force, 2007) thereby reducing potential adverse affects to water resources.

Ecological Monitoring

Under the Proposed Action, NRS management would continue to integrate monitoring data from management activities on target communities. Monitoring results of feral hog activity (trapping and removal), and the Aquatic Monitoring Program are two programs utilizing monitoring data to develop adaptive management strategies.

The two greatest threats to sensitive seepage slopes and riverine steephead habitat on the Eglin reservation are damage by feral hogs and encroachment of woody species resulting from low fire frequencies (Engeman, et al. 2007). Continued efforts to integrate monitoring data for both feral hog trapping and the removal of invasive hardwood species would provide feedback inform managers of the success of control methods.

The Aquatics Monitoring Program would continue efforts to integrate monitoring data from stream communities in an effort to identify quality “background” (or reference) data. Monitoring data feedback is needed for habitat restoration decisions, an imperative input to the adaptive management process. Monitoring data collected by partnering agencies (FDEP, USFWS, etc.) include biological (benthic indexing, fish species observance), physical (particle analysis, longitudinal profiling and other stream characteristics) and chemical (dissolved oxygen, specific conductance, pH, temperature) data.

The Proposed Action would likely improve water resource management decision making by utilizing existing data and identifying data gaps between agency resource managers. Therefore, without change the continued practices in the Ecological Monitoring Component could positively impact surface and groundwater resources.

3.3.2.2 No Action Alternative

Wildfire Support

Potential impacts to water resources from wildfire support would be similar to those under the Proposed Action.

Forest Management

The No Action methods used for site-clearing, site-prep, and tree planting following the Forest Management Component Plan would have minimal adverse impacts to surface and groundwater. The Proposed Action only differs in the increase of acreage for tree planting, and a decrease in acreage subjected to herbicide application.

Habitat Restoration

Impacts to surface water and groundwater for the No Action alternative would be similar to the Proposed Action.

Invasive Non-native and Nuisance Animal Species Management

The No Action alternative for trapping and removal of feral hogs would be similar to increased trapping activities in the Proposed Action. Both action alternatives would prevent further destruction of seepage slope and riverine steephead habitat, protecting the water quality and vegetation of these unique habitats.

Protected Species Monitoring and Management

No Action activities to remove invasive hardwoods from flatwoods salamander ponds are not expected to adversely impact surface water or groundwater resources

Ecological Monitoring

Ecological monitoring under the No Action Alternative would have similar impacts to water resources as the Proposed Action.

Recreation Management

Recreation management activities under the No Action Alternative would have similar impacts to water resources as the Proposed Action.

3.4 BIOLOGICAL RESOURCES

3.4.1 Affected Environment

Biological resources include the native and introduced terrestrial and aquatic plants and animals found on and around Eglin AFB. The habitats of Eglin AFB are home to an unusually diverse biological community including several sensitive species and habitats.

Ecological Associations

Four broad matrix ecosystems exist on Eglin AFB: Sandhills, Flatwoods, Wetlands/Riparian, and Barrier Island (Figure 3-4). The ecosystems are defined by floral, faunal, and geophysical similarities. Artificially maintained open grasslands/shrublands and urban/landscaped areas also exist on Eglin, primarily at test areas or on the Main Base. Although grasslands/shrublands and urban/landscaped areas are not true ecological associations, they are included in this section as land uses, as they are present within the study area. NRS conducts management activities within each of the four ecological associations, with limited activities in open grasslands/shrublands and urban/landscaped areas. A list of typical species within each ecological association is provided in Appendix B, along with detailed descriptions of the ecological associations.

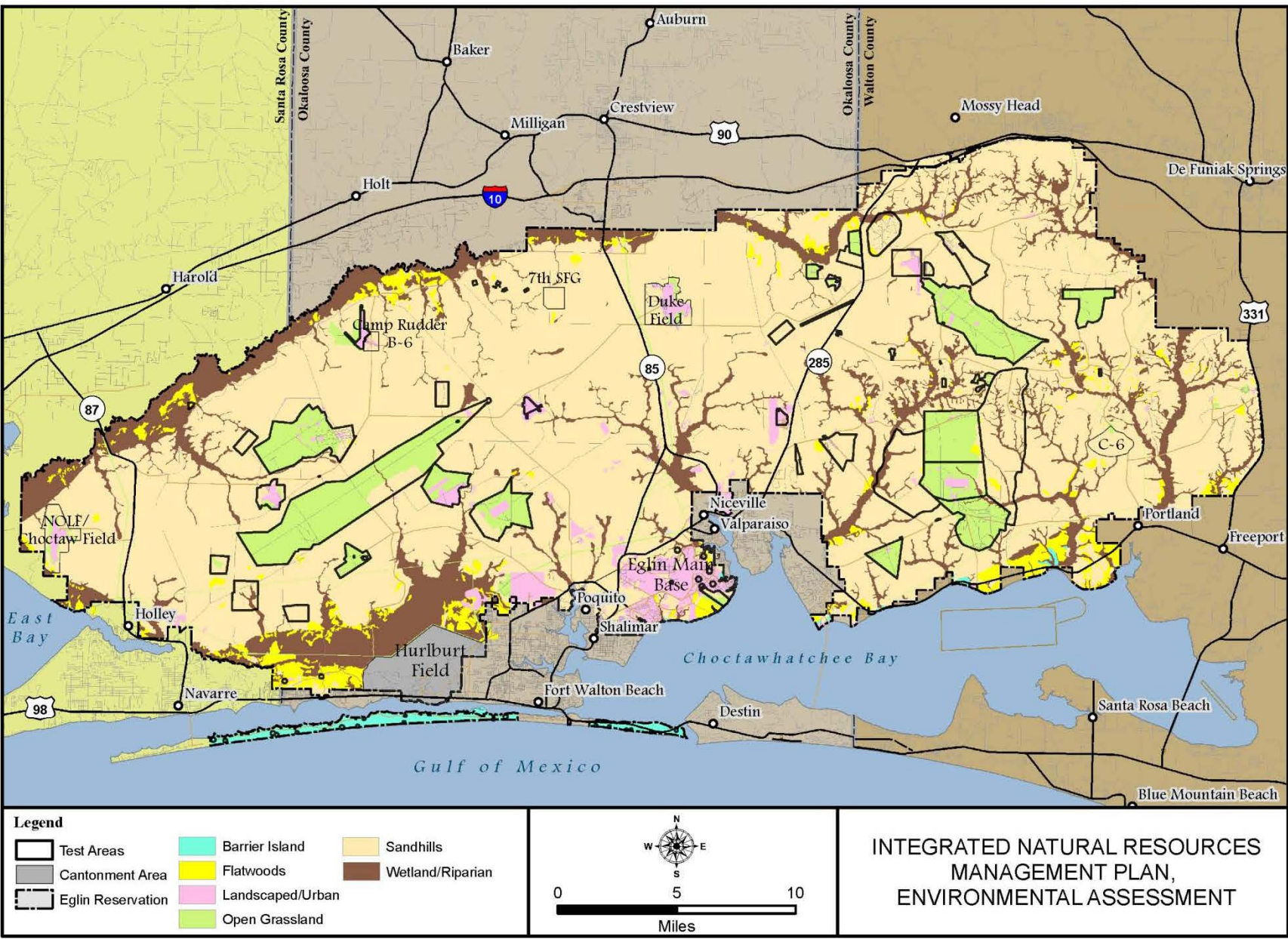


Figure 3-4. Ecological Associations at Eglin AFB

Sensitive Habitats

Sensitive habitats include areas that the federal government, state government, or the DoD have designated as worthy of special protection due to certain characteristics, such as high species diversity, rare plant species, or other unique features. The primary sensitive habitats of concern are Outstanding Natural Areas, Significant Botanical Sites, High Quality Natural Areas, wetlands, streams, and floodplains (Figure 3-5). Wetlands, streams, and floodplains are detailed in the Water Resources Section.

Sensitive Species

Sensitive species are those species protected under federal or state law, including migratory birds and threatened and endangered species. An *endangered* species is one that is in danger of extinction throughout all or a significant portion of its range. A *threatened* species is any species that is *likely* to become endangered within the foreseeable future throughout all or a significant portion of its range. Federal candidate species and all state-listed species are those that should be given consideration during planning of projects, but have no protection under the Endangered Species Act.

The ESA (16 United States Code [USC] 1531 to 1544) was enacted to provide for the conservation of endangered and threatened species and the ecosystems on which they depend. Air Force Policy Directive 32-70 directs the implementation of the ESA. Certain federal activities may require an ESA Section 7 consultation with the USFWS and/or NMFS.

AFI 32-7064 provides instructions on managing natural resources in such a way as to comply with federal, state, and local laws and regulations. This AFI calls for the protection and conservation of state-listed species when not in direct conflict with the military mission. Eglin AFB applies for appropriate permits for actions that may affect state-listed species (such as monitoring and handling) and also cooperates with the FWC to further the goals of the Florida State Wildlife Conservation Strategy.

Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703-712) and EO 13186. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. Federal agencies are to integrate bird conservation principles, measures, and practices into agency activities, and avoid or minimize adverse impacts on migratory bird resources. Also, federal agencies must provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds.

Invasive non-native species are species introduced from other countries or regions of the U.S. that threaten native plants and animals by altering the composition, structure, and function of native ecosystems.

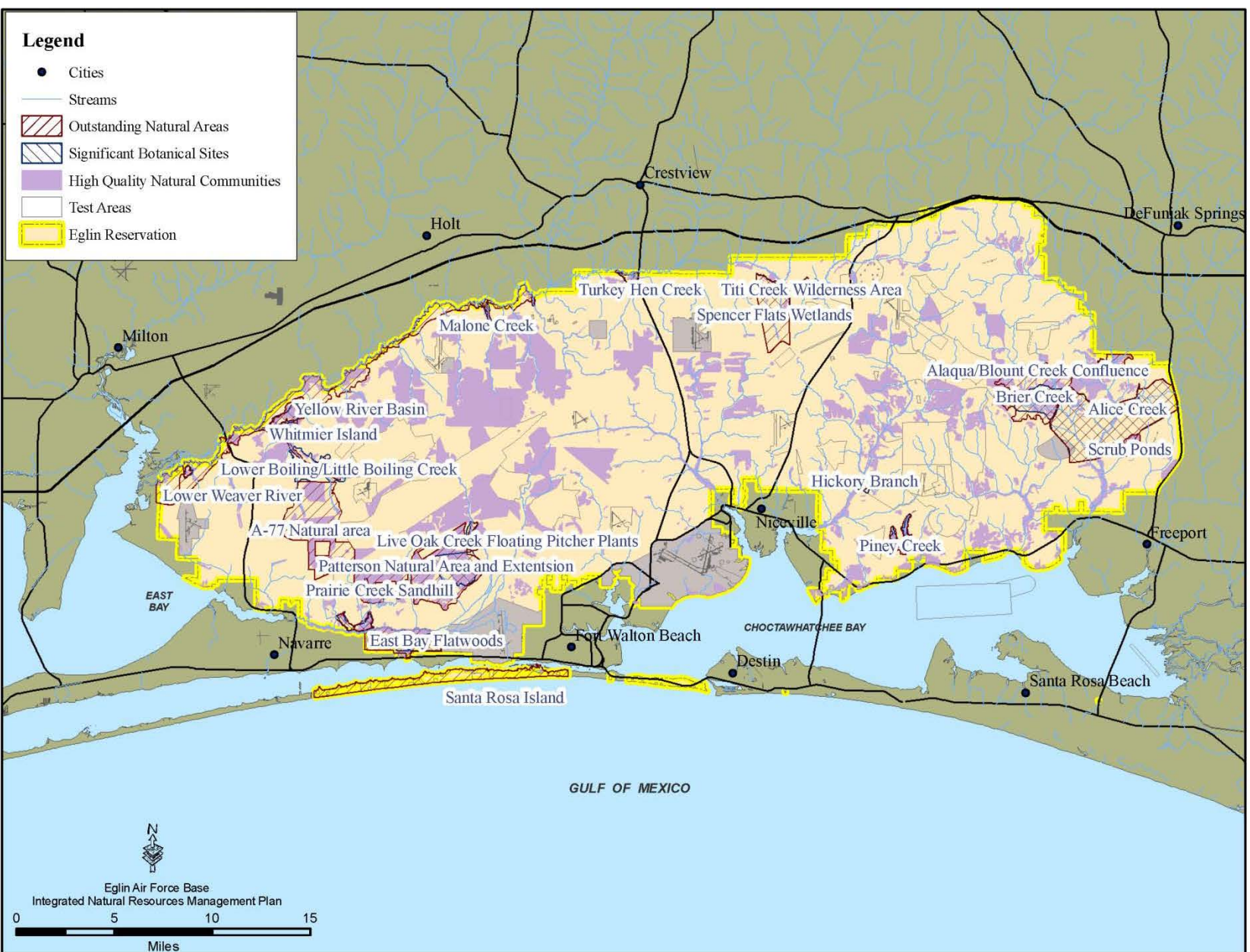


Figure 3-5. Sensitive Habitats at Eglin AFB

Sensitive species of particular interest found on Eglin AFB are listed in Table 3-22 and are depicted in Figure 3-6, Figure 3-7, Figure 3-8, and Figure 3-9. A complete list of all sensitive species on Eglin is available in Appendix B.

Table 3-22. Focal Sensitive Species at Eglin AFB

Scientific Name	Common Name	Status	
		State	Federal
Fish			
<i>Acipenser oxyrinchus desotoi</i>	Gulf Sturgeon	LT	LT
<i>Etheostoma okaloosae</i>	Okaloosa Darter	LT	LT
Mussels			
<i>Hamiota australis</i>	Southern Sandshell	-	PE
<i>Fusconaia escambia</i>	Narrow Pigtoe	-	PT
<i>Villosa choctawensis</i>	Choctaw Bean	-	PE
<i>Pleurobema strodeanum</i>	Fuzzy Pigtoe	-	PT
Amphibians and Reptiles			
<i>Ambystoma bishopi</i>	Reticulated Flatwoods Salamander	LE	LE
<i>Caretta caretta</i>	Atlantic Loggerhead Sea Turtle	LT	LT
<i>Chelonia mydas</i>	Atlantic Green Sea Turtle	LE	LE
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle	LE	LE
<i>Drymarchon couperi</i>	Eastern Indigo Snake	LT	LT
<i>Gopherus polyphemus</i>	Gopher Tortoise	LT	LC
<i>Lepidochelys kempii</i>	Kemp’s Ridley Sea Turtle	LE	LE
<i>Rana okaloosae</i>	Florida Bog Frog	LS	-
Birds			
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	LS	-
<i>Charadrius alexandrinus</i>	Snowy Plover	LT	-
<i>Charadrius melodus</i>	Piping Plover	LT	LT
<i>Haliaeetus leucocephalus</i>	Bald Eagle	LT	BGEPA
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE	LE
<i>Rynchops niger</i>	Black Skimmer	LS	-
<i>Sterna antillarum</i>	Least Tern	LT	-
Mammals			
<i>Peromyscus polionotus leucocephalus</i>	Santa Rosa Beach Mouse	-	-
<i>Ursus americanus floridanus</i>	Florida Black Bear	LT*	-
Lichens			
<i>Cladonia perforata</i>	Florida Perforate lichen	LE	LE

BGEPA = Bald and Golden Eagle Protection Act; LC = Candidate; LE = Endangered; LT = Threatened; LS = Species of Special Concern; PE = Proposed Endangered; PT = Proposed Threatened

- = Not currently listed, but are tracked by FNAI due to rarity.

* = State listed as LT but not applicable in Baker and Columbia counties or the Apalachicola National Forest.

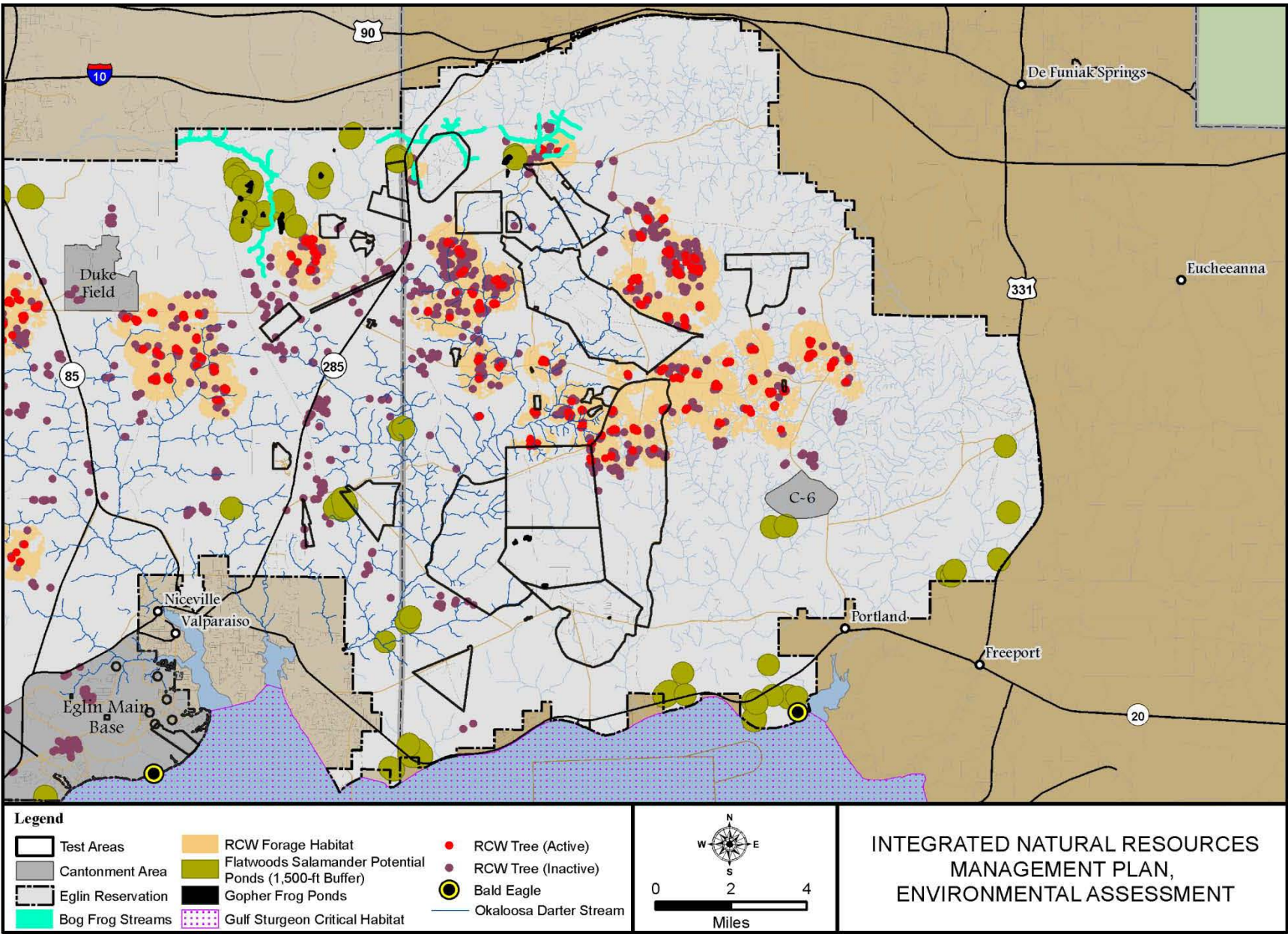


Figure 3-6. Sensitive Species on Eglin Mainland (East)

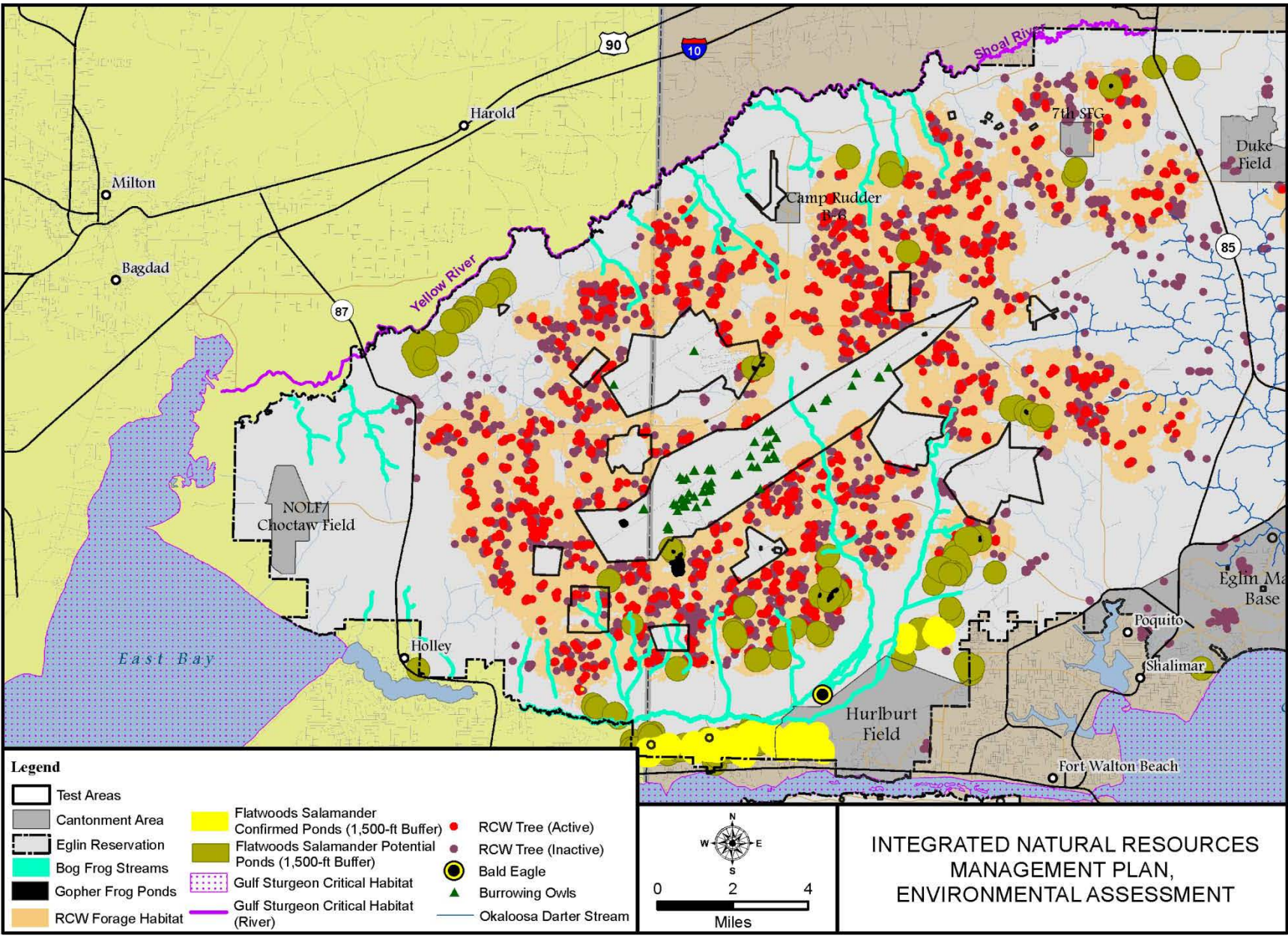


Figure 3-7. Sensitive Species on Eglin Mainland (West)

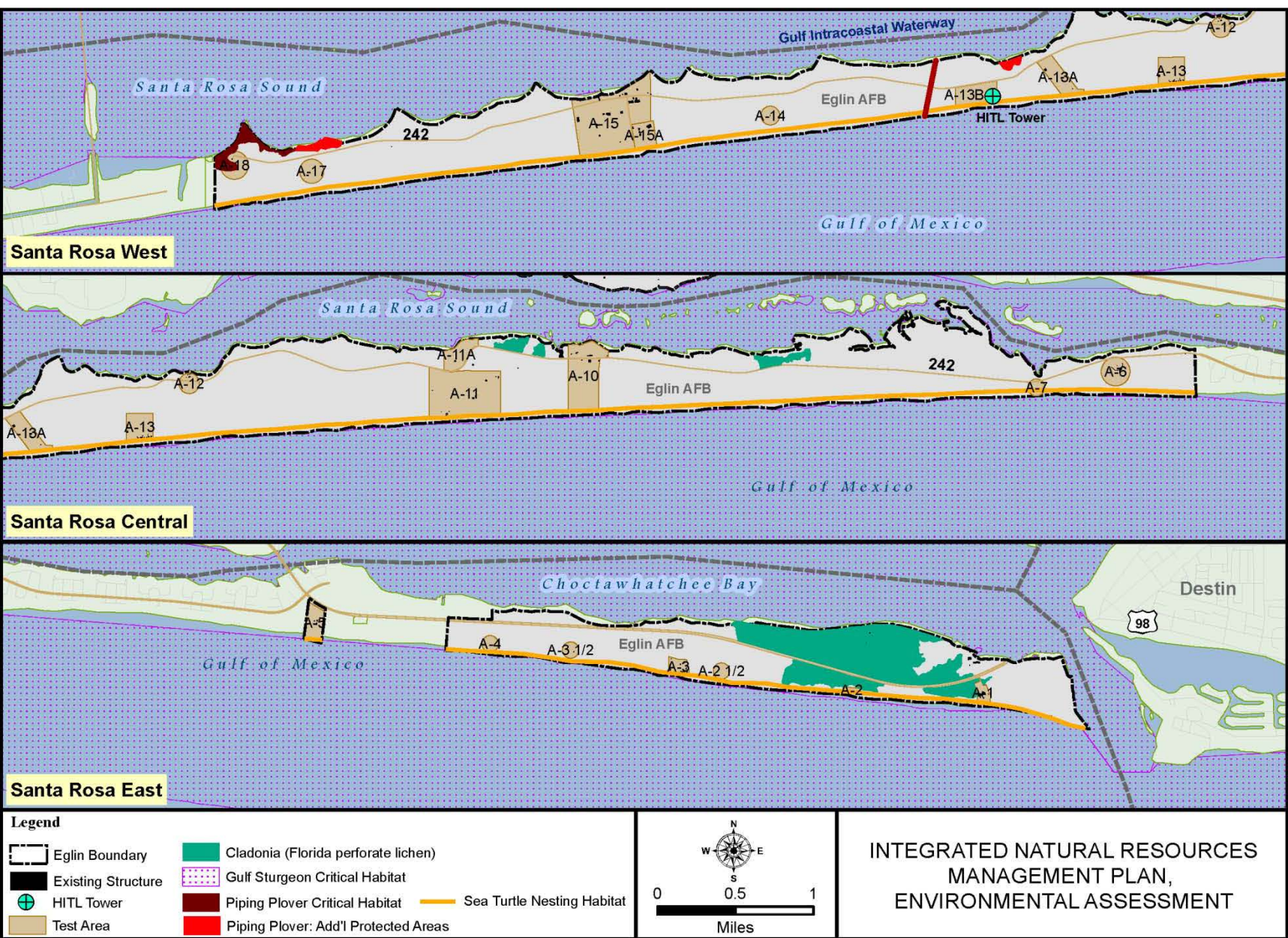


Figure 3-8. Sensitive Species at SRI

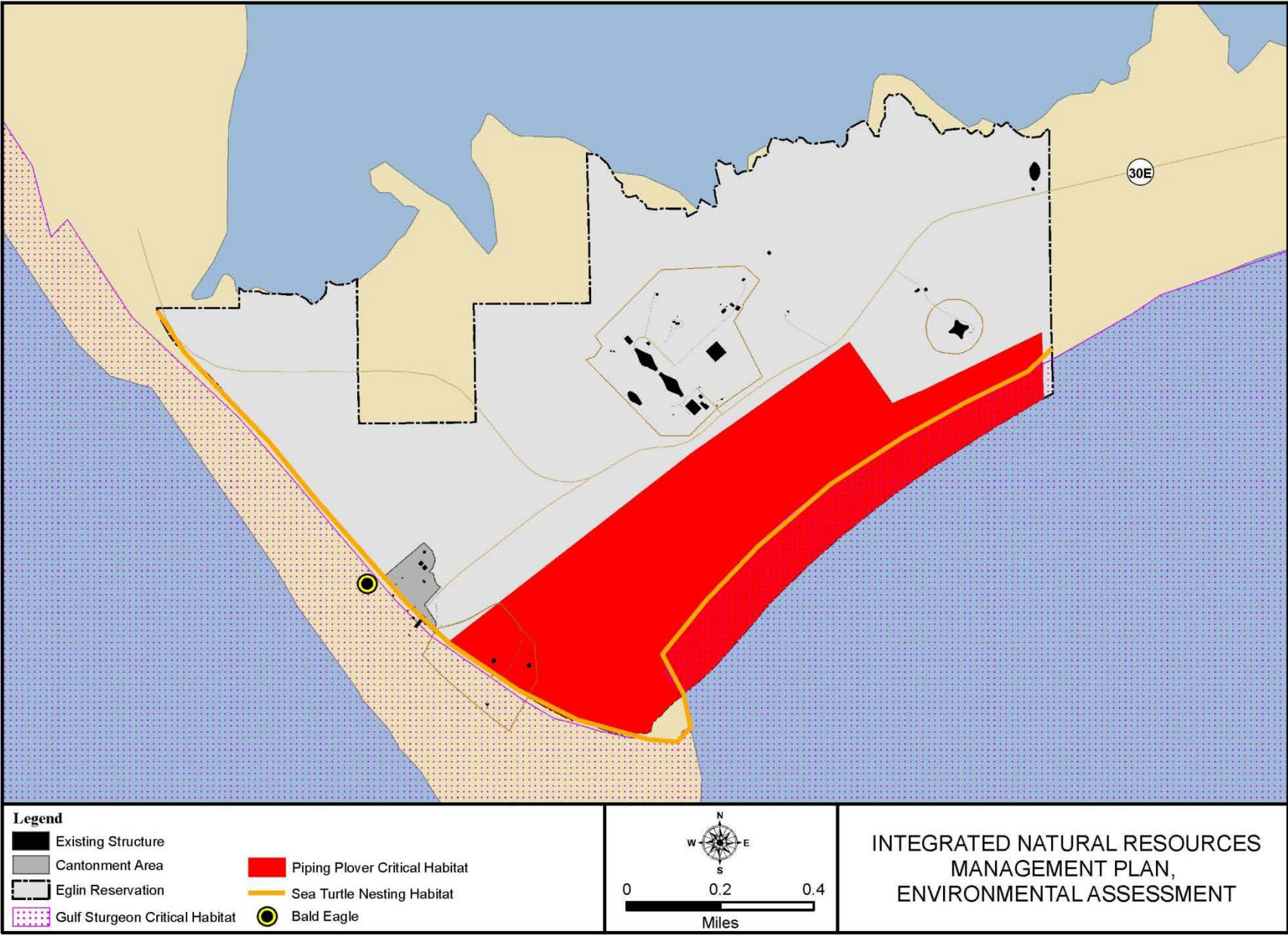


Figure 3-9. Sensitive Species at CSB

3.4.2 Environmental Consequences

This section discusses potential impacts to biological resources from natural resources management activities conducted on the Eglin Complex. Resources include terrestrial and aquatic species and habitats. Potential impacts were analyzed according to general effector categories, which were identified as noise, direct physical impact, and habitat alteration. Species and habitats would be both beneficially and negatively affected by various natural resource management activities. However, implementation of specific management actions detailed in Chapter 2 would reduce the degree of effects. Eglin is conducting a Section 7 ESA Consultation with the USFWS for potential impacts to federally listed species from INRMP activities; all requirements resulting from the consultation will be incorporated into this document.

3.4.2.1 Proposed Action

Prescribed Fire

Ecological Associations and Sensitive Habitats

Potential impacts to biological resources from fire vary from beneficial to destructive depending on the habitat type and the conditions under which the fire occurs. Prescribed burning is the primary management tool used to restore and maintain the majority of natural communities on Eglin, including sandhills, flatwoods, and some wetland/riparian communities which require frequent fire to maintain their natural structure and composition. If the return interval between fires exceeds five years, hardwood competition and sand pine invasion typically begin to degrade the native understory and alter fuel loads. The re-introduction of fire in these suppressed areas typically involves dormant season burns or night burns to avoid hot fires that degrade habitats by damaging or killing overstory and understory species.

Eglin maintains approximately 270,000 acres with prescribed fire (90,000 acres annually on a 3 year rotation), primarily within the Core Conservation Area, which includes special natural areas and important habitats for T&E species (Figure 3-10). Each year, the NRS determines high priority areas for burning using the Burn Prioritization Model; the model incorporates factors such as presence of T&E species and time since last burn. To minimize potential future impacts from prescribed fires in ONAs, SBSs, and HQNCs, NRS managers are in the process of establishing management protocols for each of the ONAs on Eglin, including fire prescription guidelines for the best conditions to burn at these sites.

Due to the extensive road network on Eglin, most burn blocks are delineated by roads, thus there is minimal need for plowing for fire breaks. Fragmentation due to fire breaks is a minimal concern on Eglin. Additionally, since the majority of prescribed fires are set aerially from helicopters or by ATV-mounted drip torches along roads, there is minimal ground disturbance associated with prescribed burning at Eglin.

Maintenance of an average of 90,000 acres of prescribed fire annually would have no significant negative impacts on sensitive habitats, and would have an overall beneficial effect for natural habitats on Eglin.

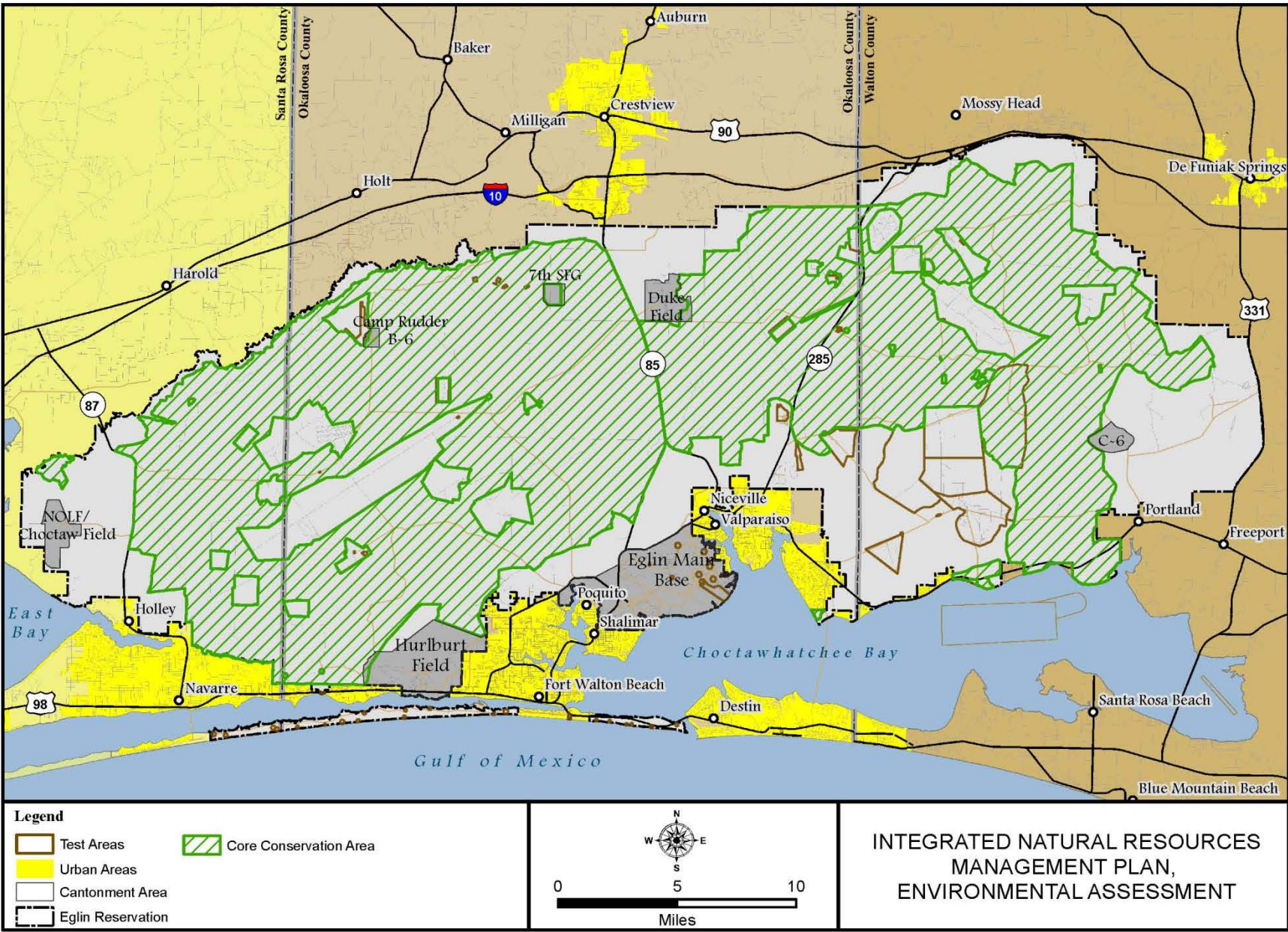


Figure 3-10. Eglin Core Conservation Area

Wildlife

Although most wildlife would find cover, remain safe from the fire in burrows or other cover, or escape to an area of no fire, some direct wildlife impacts may occur from prescribed fires and associated heavy equipment use. Small mammals and snakes may be impacted if they are not able to escape the fire area. Indirectly, wildlife may be impacted by the change in habitat type. Although an overall beneficial ecological change has been shown with Eglin's aggressive prescribed fire program, the decrease in mid story vegetation and cover for many species such as mice would leave them more vulnerable to birds of prey. Given the relatively small area of prescribed burns, the size of Eglin AFB, and the maneuverability of wildlife, impacts to wildlife would not be not significant.

Sensitive Species

Prescribed fire provides an overall beneficial impact for sensitive species; however, heavy equipment use and burned cavity trees may negatively affect individual animals. Most of the protected species on the Eglin mainland live in fire maintained habitats, thus too little fire can negatively affect the health of these populations, including the RCW, flatwoods salamander, indigo snake, and gopher tortoise, among others. Fires at the right frequency and under the correct conditions maintain cover and foraging habitat for these species. However, fires also have the potential to injure or kill RCW cavity trees and nestlings if the sap on these trees ignites.

RCW. To maintain high quality RCW foraging habitat, fire is prioritized in active RCW clusters at a return interval of between two and three years using Eglin's fire prioritization model (Hiers et al., 2003). Due in large part to an aggressive prescribed fire program, the RCW population on Eglin exceeded the designated recovery goal of 350 potential breeding groups (PBGs) in 2009. To meet Eglin's mission flexibility goal of at least 450 PBGs by 2015, at a minimum prescribed fire must continue at current levels.

To reduce the potential for fire damage to RCW cavity trees, fire crews prepare all active RCW cavity trees in prioritized burn blocks by cutting fuels around the individual cavity trees out to a distance of approximately 5 meters using a Brown tree cutter, Positrack mower, or D.R. mower mounted behind an all terrain vehicle (ATV), and then raking the clippings away from the trees with rakes. At Eglin when trees have been prepared in advance, average cavity tree mortality has been reduced from six percent to two percent (Williams et al., 2004).

In addition to the fire preparation that takes place around cavity trees, a trained RCW monitor who is familiar with fire behavior is present on all prescribed burns that involve active clusters or recruitment clusters, except those within UXO restricted suppression areas (Figure 3-11). The monitor observes trees that have a high risk of being burned during the fire, lights a backing fire at the outer edge of the mowed circle of reduced fuel, and has input on firing patterns in order to minimize potential damage to cavity trees. The monitor may also stop a burn if conditions are deemed harmful to cavity trees or significant portions of foraging habitat.

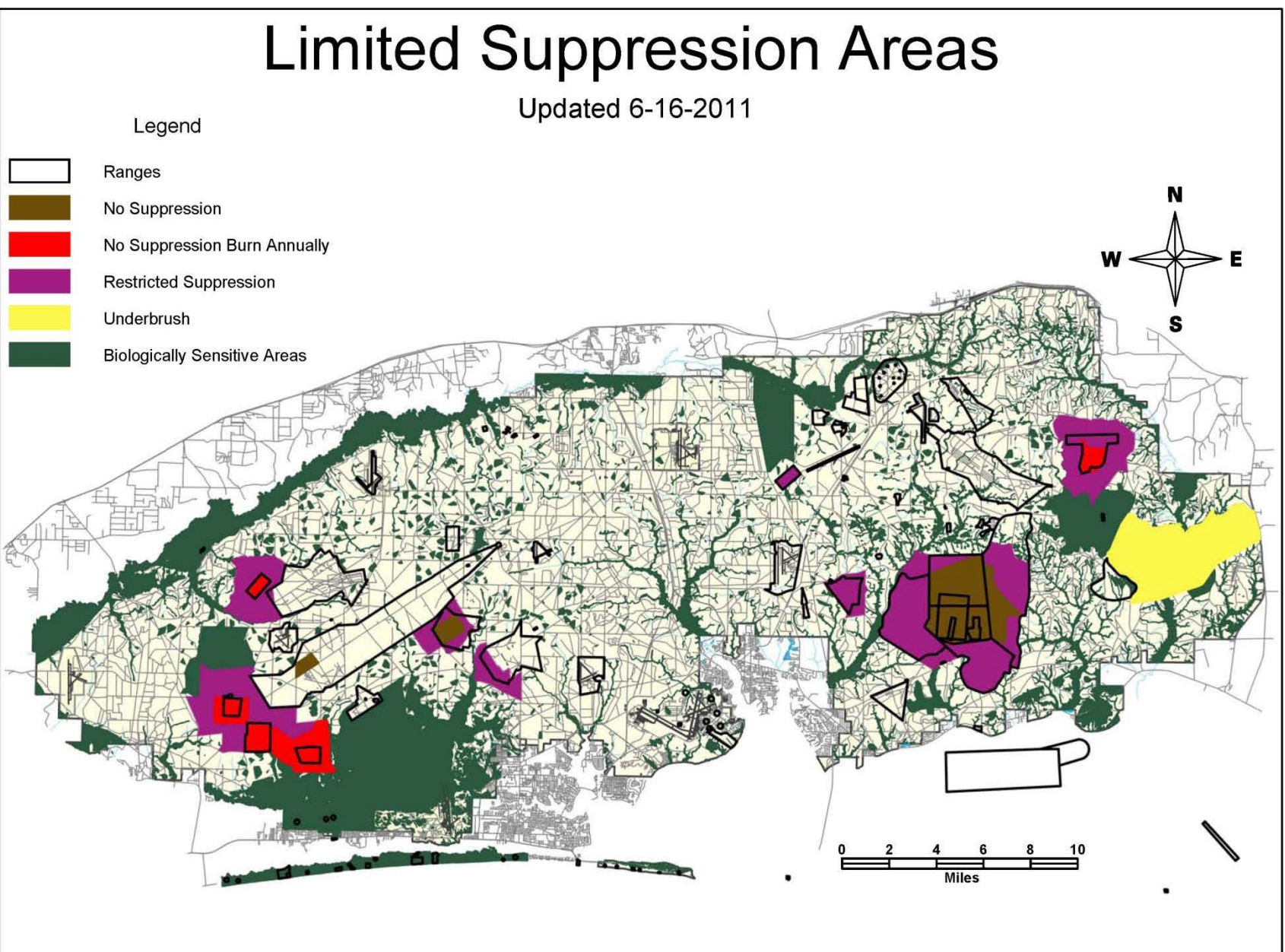


Figure 3-11. Limited Suppression Areas

A recent change in firefighter safely policy has restricted NRS personnel from being present within certain portions of Eglin with high UXO possibility while fire is on the ground. The risk of UXO potentially in or on the ground in these “no suppression” and “restricted suppression” areas was deemed sufficient to require modified burning and suppression tactics to lower UXO explosion potential (Table 3-23).

Table 3-23. No Suppression, Restricted Suppression, and Biologically Sensitive Areas

No Suppression	Due to a high level of contamination from UXO and shrapnel, several target areas including B-7, A-77, A-78, B-82, the “rice patties” area of B-70 and much of C-52 have been identified as “No Suppression Zones.” Suppression activities will generally be replaced with a monitoring strategy until the fire can be declared out.
Restricted Suppression	Plows will not be used off of range roads for fireline construction except in extreme conditions and with the approval of the WFPM, the Natural Resources Manager, or their designee. Fire operations are limited in the Restricted Suppression Zones due to elevated risk of UXO.
Biologically Sensitive Areas	To prevent ecosystem degradation from the modification of hydrology and vegetative damage, plows will not be used off of range roads for fireline construction except in extreme conditions and with the approval of the WFPM, the Natural Resources Manager, or their designee. Other biologically sensitive areas where plow operations are generally not conducted include seepage slopes, isolated wetlands, steepheads, high quality natural areas, and threatened and endangered species habitat. If wildfire conditions are such that plowed lines are deemed necessary in these areas, the WFPM, Assistant WFPM, Chief of Natural Resources, or their designee(s) will approve the use and location of the lines.

WFPM: Wildland Fire Program Manager; UXO: Unexploded Ordnance

Within the no and restricted suppression areas, monitors cannot be present within the fire perimeter while fire is on the ground, and no observation of trees can be conducted until after the fire is certified to be out (usually several hours after the fire has passed the area). Although this constraint is small, it increases the potential for direct physical harm and harassment should fire reach the cavity and/or damage the tree. To minimize potential impacts in these clusters, pre-fire preparation may be extended out further from the tree or fire resistant foam or water may be applied on or around the tree prior to fire being set. All cavity trees in these areas will be checked immediately following the fire to assess damage and to determine the need for replacement cavities. If any active cavity tree is lost to prescribed fire activities, the cavity tree will be replaced within 72 hours with a box insert. Additionally, the majority of the areas in the no and restricted suppression areas are burned annually, which decreases the fuel load so that fires are generally not damaging to the trees (Figure 3-11).

The increasing tempo and extent of ground training operations has already begun to limit access to certain burn blocks for large periods of the year. To effectively maintain these habitats with prescribed fire, additional adjustments for fire management will be required. One of these changes will be an increase in night time prescribed burning to meet acreage goals for habitat restoration. Night fires do not tend to burn as hot due to higher humidity and lower winds, thus reducing the likelihood of tree ignition. However, there is an increased risk of harassment for any cavity tree that does ignite because RCWs would be roosting in their cavity trees at night. Although the NRS believes the risk is small for direct impact, night burning may result in harassment to RCWs. As described previously, cavity tree preparation will be done and RCW monitors will be present for nighttime burns to reduce the potential for damage to trees or harassment to roosting RCWs.

During the previous Eglin INRMP Section 7 Consultation, the USFWS concurred with Eglin's Not Likely to Adversely Affect determination for the RCW (U.S. Air Force, 2002; USFWS, 2002). Although fire-related cavity tree kill has been limited during the past ten years due to high fire frequency and thorough pre-burn cavity tree preparation activities, the recent change in policy with the no and restricted suppression areas has prompted the NRS to re-consult with the USFWS. The planned increase in nighttime burning is also a consideration due to the increased risk of harassment and direct harm to RCWs. Prescribed fire activities are likely to negatively impact individual RCWs and RCW cavity trees, but these impacts would not be significant; additionally, prescribed fire will have an overall beneficial impact on RCW foraging habitat and is an essential component of management of the species.

Flatwoods Salamander. Under the INRMP, NRS would maintain approximately 17,000 acres of flatwoods salamander habitat using prescribed fire on a three year rotation to keep woody vegetation at appropriate levels. In the final rule for listing of the salamander, prescribed fire conducted in accordance with recommended timber management practices is an action that is not likely to adversely affect flatwoods salamanders (Federal Register, 1999); NRS will continue to follow these guidelines. Fire lines are primarily on established roads within salamander habitat. However, for necessary firebreaks along the urban interface within wetland areas, a low ground pressure positrack tracked vehicle would be used for mowing and work would be done during dry periods in accordance with requirements from the *Gyrotrack Section 7 consultation* (U.S. Air Force, 2003b). Fire crews will be briefed on protection of flatwoods salamander habitat prior to and during the fire season. Prescribed fire activities would not significantly affect the flatwoods salamander, and would have overall beneficial impacts for the population.

Okaloosa Darter. Prescribed fire activities and the associated use of heavy equipment in riparian areas have the potential to negatively affect the Okaloosa darter through modification of hydrology and vegetative damage. However, fire lines are primarily on established roads within riparian areas around Okaloosa darter streams. Additionally, the special rule 4(d) allows take during prescribed fire activities that are consistent with the Eglin INRMP (Federal Register, 2011). Prescribed fire activities would not significantly impact the Okaloosa darter.

Indigo Snake and Gopher Tortoise. Prescribed burning activities have the potential to impact indigo snakes and gopher tortoises through temporary habitat disturbance and incidental contact with equipment. However, NRS would minimize the potential for negative impacts by halting activities if an indigo snake or gopher tortoise is sighted and allowing it time to move to safety. Additionally, gopher tortoise burrows would be avoided by 25 feet. Prescribed burning would have no significant negative impacts on the indigo snake or gopher tortoise, and would provide an overall beneficial effect through habitat maintenance and restoration.

Florida Bog Frog. Prescribed fire activities and the associated use of heavy equipment in riparian areas have the potential to negatively affect the Florida bog frog through modification of hydrology and vegetative damage. However, fire lines are primarily on established roads within riparian areas around bog frog streams. Any damage to streams and stream banks would be repaired. Therefore, prescribed fire activities would not significantly impact the Florida bog frog.

Florida Burrowing Owl. Prescribed burning has the potential to impact individual burrowing owls and their burrows through temporary habitat disturbance and incidental contact with

equipment. While it is possible that vehicles could crush an owl, burrow or egg clutch, this risk is minimized by the fact that vehicle activity will be limited for the most part to established roads and trails. Burrows would be avoided by 25 feet. Thus, prescribed burning would not significantly impact the Florida burrowing owl.

Wildfire Support

While wildfires may sometimes provide beneficial results in fire-adapted habitats, they just as easily can cause damage if they burn too hot; thus, prescribed fire is the preferred method for managing fire-maintained habitats on Eglin. This Wildfire Support section only analyzes the impacts of NRS wildfire *support* activities; impacts from the wildfire itself require separate analysis, and must be covered in mission-related REAs. Even with Eglin's active prescribed fire program, over 150 wildfire starts a year are anticipated, the majority of which are associated with missions (refer to Table 2-1). The Fire Element currently employs 14 full time equivalent (FTE) government positions and 4 FTE contractor positions. To maintain adequate response time, fire containment, and RCW tree protection, plans are to hire four additional firefighters.

Ecological Associations and Sensitive Habitats

Suppression techniques range from full, direct line construction to a block and burn containment strategy depending on fuel, mission, and other installation fire activity. The policy of the NRS is to avoid plowing for suppression unless absolutely necessary; block and burn methods are preferable. At times, plowing may be required to avoid impacts to mission activities or assets, or to prevent escape of wildfires at the urban interface. Plowing can result in soil disturbance, vegetation damage, and alterations in hydrology, so plows will not be used off of range roads for fireline construction in Biologically Sensitive Areas except in extreme conditions (Figure 3-11). Biologically Sensitive Areas include seepage slopes, isolated wetlands, streams, steepheads, high quality natural areas, and threatened and endangered species habitat. Any damage caused by plow lines in sensitive areas is assessed following control of the wildfire, and restoration efforts are made to repair damage. Wildfire support activities would not result in significant negative impacts to sensitive habitats.

Wildlife

Direct impacts from heavy equipment used for wildfire suppression may impact wildlife, particularly species that are not highly mobile. However, the NRS strives to avoid plow lines off of roads whenever possible, thus minimizing the probability of an encounter. Impacts to wildlife from wildfire control efforts would not be significant.

Sensitive Species

RCW. Restriction of access to no and restricted suppression areas while active fire is on the ground limits the ability of firefighters to protect RCW cavity trees within these areas. Direct impacts would be similar to prescribed burns as described previously in the sense that RCW monitors would not be allowed in the area to protect trees during active fire, and in some cases trees may not have been prepped.

To minimize damaging wildfires in areas with high wildfire potential, the NRS prioritizes most no suppression areas for annual burning. Most of the no suppression areas are near Test Areas A-77, A-78, A-79, and B-7 (Air to Ground Gunnery ranges). For the *Air to Ground Gunnery Section 7 Consultation* (FWS No. 4-P-04-249), USFWS concurrence was predicated on Eglin's agreement to follow certain avoidance and minimization measures, summarized here:

- To decrease the intensity of fires, maintain a two-year burn return interval around A-77, A-78, A-79, and B-7
- Prep RCW cavity trees prior to prescribed burning operations
- Replace any cavity tree damaged by fire to the point it is unsuitable for nesting or roosting with an artificial cavity (box insert) within 72 hours of the damage.

These areas are now designated as “no suppression burn annually” areas to minimize the potential for damage to RCW trees from intense wildfires (Figure 3-11).

New restrictions on wildfire suppression may result in impacts to RCWs and/or active RCW trees; however, impacts from the actual wildfire must be addressed separately in mission-specific REAs. Wildfire support activities themselves would not cause significant impacts to RCWs, and may serve to reduce impacts to trees that are protected from damaging wildfire. Block and burn techniques of wildfire control may result in beneficial effects for some areas if fire conditions are right.

Flatwoods Salamander. Wildfire suppression activities and the associated use of heavy equipment in wetland areas may negatively affect the flatwoods salamander through modification of hydrology and vegetative damage. As a protective measure, flatwoods salamander ponds and buffers are included as part of the Biologically Sensitive Areas shown on the Limited Suppression Map (Figure 3-11), thus plows are not used off of range roads for fire suppression except in extreme conditions within these sensitive areas. Fire crews would be briefed on protection of flatwoods salamander habitat prior to and during the fire season.

The following activities would only be conducted under emergency conditions: tying fire lines into ponds, plowing fire line in or around ponds, using foam in or around ponds. NRS would conduct an incident letter with the USFWS for any of these activities in flatwoods salamander ponds or buffers from wildfire control efforts, and would conduct restoration in coordination with the USFWS. Although wildfire support activities may negatively affect flatwoods salamanders, these impacts would not be significant. Other than extreme emergency situations, wildfire suppression activities are not likely to negatively affect the flatwoods salamander, and impacts would not be significant. Block and burn techniques of wildfire control may result in beneficial effects for some areas if fire conditions are right.

Okaloosa Darter, Gulf sturgeon, Freshwater Mussels, and FL Bog Frog. Wildfire suppression activities and the associated use of heavy equipment in riparian areas may negatively affect the sensitive aquatic species through modification of hydrology and vegetative damage. However, riparian areas are included as part of the Biologically Sensitive Areas shown on the Limited Suppression Map (Figure 3-11); plows are not used off of range roads for fire line construction except in extreme conditions within these areas. Any damage to streams and stream banks

would be repaired in coordination with the USFWS. Eglin would conduct an incident letter if suppression damage were to occur during extreme wildfire conditions. Wildfire support activities would not result in significant impacts to the Okaloosa darter, Gulf sturgeon, freshwater mussels, or FL bog frog.

Indigo Snake and Gopher Tortoise. Wildfire support activities may impact indigo snakes and gopher tortoises through temporary habitat disturbance and incidental contact with equipment. However, NRS would minimize the potential for negative impacts by halting activities if an indigo snake or gopher tortoise is sighted and allowing it time to move to safety. Additionally, gopher tortoise burrows would be avoided by 25 feet. Wildfire support activities would have no significant negative impacts on indigo snakes or gopher tortoises.

Florida Burrowing Owl. Wildfire support activities have the potential to impact individual burrowing owls and their burrows through temporary habitat disturbance and incidental contact with equipment. While it is possible that vehicles could crush an owlet, burrow or egg clutch, this risk is minimized by the fact that vehicle activity will be limited for the most part to established roads and trails. Burrows would be avoided by 25 feet. Thus, wildfire support activities would not significantly impact the Florida burrowing owl.

Forest Management

The majority of forest management activities support the maintenance and restoration of native habitats within the CCA. However, these same activities may cause short-term negative impacts to some biological resources, such as sedimentation, vegetation disturbance, and herbicide impacts, or may result in direct impacts to sensitive species.

Ecological Associations and Sensitive Habitats

Forest management activities serve to increase the amount of quality Sandhills and Flatwoods habitats on Eglin through the removal of invasive sand pine and planting of longleaf pine (Figure 3-12). There may be localized ground disturbance resulting from use of heavy equipment, but Eglin would minimize the potential for erosion and sedimentation by following the *Silvicultural BMPs for Florida* (FDOACS, 2011) (see Soils and Water Resources sections for additional information). Efforts are also made to reduce groundcover degradation by reducing the amount of high-intensity site prep for forest management operations. Single drum chopping is used whenever possible in pine plantations as opposed to bedding and root-raking. Eglin would also follow the requirements of the LVC EA to minimize potential effects to non-target resources from herbicides (U.S. Air Force, 2007).

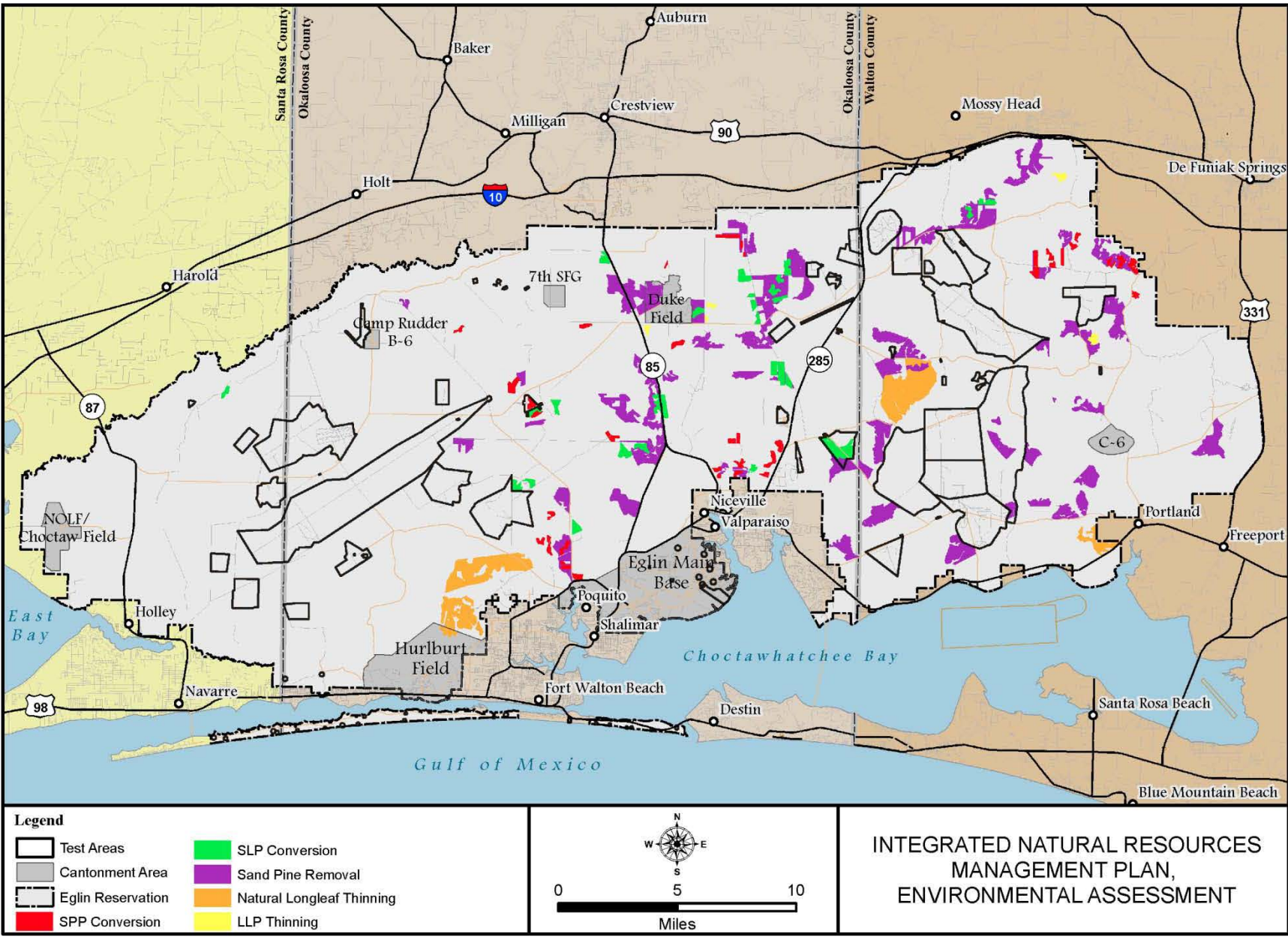


Figure 3-12. Priority Areas for Forest Restoration Timber Sales

There is the potential for forest management activities in ONA, SBSs, and HQNCs to either benefit or harm the quality of these areas. Under the Proposed Alternative, a process or plan would be formalized to ensure that special considerations for these areas are incorporated into forest management operations. Special considerations might include limitations on longleaf thinning and herbicide use.

Forest management activities would not have significant negative impacts on natural habitats or sensitive habitats, and would have an overall beneficial effect.

Wildlife

Forest management activities may directly impact certain wildlife or damage their habitats through heavy equipment use or unintended effects on non-target resources from herbicides. However, most species are likely to move away from the disturbance caused by forestry operations, and precautions detailed in the LVC EA would minimize impacts to non-target wildlife. Forest management activities would not result in significant negative impacts to wildlife and would typically result in long-term beneficial impacts.

Sensitive Species

Forest management activities such as longleaf pine conversion have a net overall benefit to the ecosystems that support many of the sensitive species on the Eglin Reservation. However, while Eglin NRS forestry takes every precaution to prevent a mishap, negative impacts (noise, incidental contact) to sensitive species may occur due to unforeseen events involving heavy equipment while conducting restoration forestry activities near areas of concern. To avoid the potential for behavioral impacts to RCWs, mechanized equipment would not be used within an RCW cluster during nesting season. For application of herbicides within an RCW cluster, procedures in the *Hexazinone Application on Interstitial Areas* consultation and *LVC BA* would be followed (U.S. Air Force, 2001; U.S. Air Force, 2007).

Forest management operations would follow the *Silvicultural BMPs for Florida* (FDOACS, 2011) to minimize the potential for sedimentation impacts to species in streams and wetlands, such as the Okaloosa darter, freshwater mussels, Gulf sturgeon, flatwoods salamander, and Florida bog frog. Likewise, silvicultural activities would take place in accordance with the Bald and Golden Eagle Protection Act and associated guidelines. In flatwoods salamander habitat, forestry operators would abide by the *Recommended Timber Management Guidelines* (Federal Register, 1999). Forest operations would avoid gopher tortoise and burrowing owl burrows by 25 feet, and operators would stop if a gopher tortoise, indigo snake, or black bear is spotted until the animal has safely left the area. To minimize impacts to non-target resources, herbicide use would follow requirements in the *LVC BA* (U.S. Air Force, 2007).

Forest management activities would not have significant negative impacts on biological resources, and would have an overall beneficial effect.

Habitat Restoration

Although INPS control, erosion control, and fish passage projects have an overall beneficial impact, these restoration activities may also cause localized, short term negative impacts in surrounding habitats, and may affect non-target individual animals.

Removal of INPS results in improvements in native biodiversity and ecosystem functioning, and benefits multiple sensitive species including the RCW, flatwoods salamander, indigo snake, piping plover, perforate lichen, and various state listed species. To minimize the potential for negative impacts to non-target resources, herbicides would be used in accordance with requirements from the LVC EA (U.S. Air Force, 2007). Thus, INPS control would not significantly impact sensitive species or habitats, and would have an overall beneficial effect.

Improved stream conditions and connectivity are the primary goals of the NRS erosion control program, which uses methods such as culvert removal/replacement, earth moving, and planting to stabilize slopes and restore natural flow patterns. The final rule down-listing the Okaloosa darter incorporates a special rule under Section 4(d) of the ESA that details allowable impacts for certain actions that have the purpose to improve darter habitat, including in-stream habitat restoration, unpaved range road stabilization, and removal or replacement of culverts for the purpose of road decommissioning, improving fish passage or enhancing stream habitat. Increased restricted access controls around sensitive areas (i.e., erosion control projects for darter habitat restoration) would also have beneficial effects for the Okaloosa darter by reducing the potential for habitat destruction associated with public access. Thus, impacts from fish passage and erosion control activities would not be significant as covered in the Special Rule 4(d), and would result in overall beneficial impacts for the Okaloosa darter, other aquatic species, and aquatic habitats. Although erosion control actions near RCWs and RCW foraging habitat have the potential to disturb RCWs, all of these actions are coordinated internally at Eglin NRS between forestry and wildlife elements to lessen any potential impacts from earth moving or planting.

Habitat restoration would not result in significant negative impacts on biological resources, and would provide long-term benefits through habitat improvements.

Non-native and Nuisance Animal Management

BASH and nuisance animal control activities would negatively affect select individuals through displacement or mortality, but would not result in any negative effects at the population level. Eglin maintains permits to conduct BASH and nuisance animal control, and is in compliance with all state and federal laws for these activities.

Control efforts for feral hogs, beavers, and coastal predators would positively affect sensitive habitats and species on Eglin by reducing predation on and competition with native species, and reducing degradation of sensitive habitats. Feral hogs root in sensitive aquatic habitats such as seepage slopes, steepheads, stream banks, and wetlands, causing soil disturbance and excess sedimentation. Hogs have caused damage in many of the aquatic ONAs and SBSs on Eglin, and have also damaged riparian areas of Okaloosa darter and Florida bog frog streams, and flatwoods salamander and gopher frog wetlands. As part of ongoing monitoring in some of these habitats, biologists look for hog damage and focus hog control efforts in areas where damage is detected.

Removal of hogs from these sensitive habitats improves habitat condition, and also improves the health of native species living in these areas.

The NRS also conducts beaver control as necessary to protect road assets and to restore natural hydrology on Okaloosa darter streams. Beaver stream impoundments alter normal darter movements and modify specific stream hydrological conditions required for darter habitat. Beaver management would prevent impoundment and other alterations to stream characteristics which negatively impact Okaloosa darters.

Beach predator control on SRI may involve habitat disturbance from foot traffic; however, the potential for impacts is minimal since personnel would avoid nesting areas and would not conduct activities at night during sea turtle season. Benefits of the program include reductions in the depredation rate of sea turtle nests and reductions in the impacts of these predators on other native wildlife such as shorebirds and the Santa Rosa beach mouse.

Invasive non-native and nuisance animal control efforts would have no significant negative effects on biological resources, and would result in long-term beneficial effects by reducing predation and habitat damage.

Ecological Monitoring

Ecological monitoring is not likely to negatively affect any biological resources on Eglin, and would actually support long-term improvements for natural resources due to adjustments in management made as a result of data collected during monitoring. Ecological monitoring supports adaptive management by informing managers of community change resulting from management actions. If impacts are negative (e.g., loss or degradation of ecosystem function and processes), management practices can be altered. Alternatively, management actions that prove to have ecologically beneficial outcomes can be perpetuated.

Aquatic monitoring activities involve physical, chemical, and biological sampling of stream habitat and water quality. While these activities may result in temporary habitat disturbance or direct physical impact to darters, these monitoring activities are low impact and are covered under the special 4(d) rule (Federal Register, 2011). Terrestrial monitoring crews collect data on factors such as vegetation type and soil moisture either along transects or in plots. Human presence may disrupt normal foraging activities for certain species (i.e., RCW); however this is considered minor behavioral disturbance. Biologists involved with ecological monitoring are familiar with the sensitive species and habitats present within their study areas, and adjust activities and timing as needed to avoid impacts.

Ecological monitoring would not result in significant negative impacts to biological resources, and would provide long-term benefits through improved management.

Protected Species Management and Monitoring

Protected species management and monitoring are not likely to have negative impacts on sensitive species or habitats, and are intended to have beneficial effects. However, any activity that involves interaction with a sensitive species poses the potential for adverse impacts to the species, either through stress-related mortality or accidental death. Eglin or Eglin cooperators

currently hold a number of permits allowing for the propagation, translocation, reintroduction, and monitoring/handling of T&E species, including RCWs, flatwoods salamanders, Okaloosa darters and others (see Table 5-2), thus potential impacts from these activities are not analyzed. Additionally, Okaloosa darter monitoring activities on Eglin are allowed take as long as activities are consistent with the INRMP under the special 4(d) rule for the Okaloosa darter.

Posting around sensitive coastal species habitat would be conducted in such a way as to avoid impacts to the species' habitats (i.e., *Cladonia*, sea turtles, piping plover). This posting would discourage access to these sensitive habitats, resulting in beneficial impacts for the species.

To improve habitat conditions and thus improve breeding potential, NRS would conduct thinning in select flatwoods salamander ponds with excessive mid-story hardwoods. To minimize any potential negative impacts, a NRS biologist would be present to supervise the cutting, which would occur sometime between May 1 and October 1 to avoid breeding season. No heavy equipment would be used so soil compaction and damage to herbaceous vegetation would be minimal. Herbicide application would be targeted to cut stumps using a U.S. EPA and Florida Department of Agriculture and Consumer Services approved herbicide for aquatic environments (e.g., Garlon 3A) immediately after cutting the plants, and would follow requirements in the LVC BA (U.S. Air Force, 2007). Hardwood thinning in flatwoods salamander ponds would result in habitat improvement in breeding ponds.

Overall, protected species monitoring and management would not cause significant impacts to biological resources, and would result in a beneficial effects for sensitive species.

Recreation Management

Ecological Associations and Sensitive Habitats

Recreation management may have negative impacts on natural communities and sensitive habitats, primarily when the public overuses an area. Recreation management occurs across all of the open portions of the Eglin Complex on the mainland, SRI, and CSB, including certain sensitive natural areas and wetlands/riparian areas. High use areas such as the public access beach, designated recreation areas, and stream access points may suffer from impacts such as vegetation disturbance and erosion. The NRS works to address the potential for these issues by posting and fencing sensitive habitats in many of these areas, including designated access points on SRI and established canoe launches on popular creeks. If problem areas are found, the NRS typically installs pole-and-cable barriers to limit access and allow areas to recover. Recreation management would not significantly impact sensitive habitats.

Wildlife

Recreation management may result in negative effects to wildlife, such as noise and habitat disturbance, and positive impacts, such as population control. Recreationists may perturb wildlife in their immediate area, but most animals are likely to just temporarily move to another area. Authorized hunting helps to maintain sustainable populations of deer, turkeys, and other sport animals, and to reduce numbers of the damaging non-native feral hog. Creation and maintenance of food plots, while potentially modifying wildlife habitat, would not cause

significant impacts as these areas represent only a small percentage of the available wildlife habitat on Eglin. Overall, recreation management would not significantly impact wildlife.

Sensitive Species

RCW. Hunting and non-consumptive outdoor recreation such as hiking has the potential to disturb RCWs and cause wildfires. However, the majority of hunting seasons occur outside of RCW nesting season, and NRS biologists have not noted any issues with hunting within RCW foraging habitat at Eglin AFB in the past 15 years (personal communication with Johnson and Gault 11-3-11). There is a potential that unauthorized activities may affect RCWs (i.e., accidental or intentional wildfires set by recreational users could damage RCW cavity trees and harass birds); however, this is not the action of the NRS and thus is not included in this biological assessment. Eglin AFB is currently evaluating and implementing new measures for public access across the range. Additional conservation law enforcement would likely deter recreationists from such unauthorized activities. Recreation management may negatively affect the RCW; however, these impacts would not be significant.

Flatwoods Salamander. Unauthorized outdoor recreation may negatively impact the flatwoods salamander due to off-road driving, wildfires due to unauthorized campfires, and insufficient conservation law enforcement in flatwoods salamander habitats. Conservation law enforcement to address these issues is currently insufficient. However, as problem areas are identified, the NRS will implement restricted access controls in these areas to reduce the potential for habitat destruction. Unauthorized activities are not part of this proposed action, thus are not addressed in this EA. Impacts to the flatwoods salamander from recreation management would not be significant.

Indigo Snake and Gopher Tortoise. Outdoor recreation management may negatively affect indigo snakes and gopher tortoises through incidental contact and potential poaching. Creation and maintenance of food plots, while potentially modifying snake and tortoise habitat, would not cause significant impacts as these areas would represent only a small percentage of the total land designated as suitable habitat for these species. Equipment operators would avoid gopher tortoise burrows by 25 feet, and operators would stop if a gopher tortoise or indigo snake is spotted until the animal has safely left the area.

Although hunting, fishing, and non-consumptive recreational activities may impact the indigo snake or gopher tortoise through incidental direct physical impact, the chances of these occurrences are small. It is likely that the animal would avoid areas with humans present. Gopher tortoises have historically been captured for food by locals, and poaching of gopher tortoises may still occur on Eglin. To minimize the potential for poaching the Eglin does not provide location information on gopher tortoise burrows on its web viewer or in public documents. Other than keeping location information restricted, Eglin does not currently have any programs in place to prevent poaching.

Recreation management would not have significant negative impacts on the indigo snake or gopher tortoise.

Okaloosa Darter, Gulf Sturgeon, Florida Bog Frog, and Freshwater Mussels. Recreation management has the potential to impact aquatic species such as the Okaloosa darter, Gulf

sturgeon, freshwater mussels, and FL bog frog through increased sedimentation and altered hydrology. However, runoff impacts from food plots are unlikely because food plots would not be established within riparian buffers, and any runoff would be short-term as vegetation is quickly established in the food plots. Beaver control would have beneficial effects for stream systems and the Okaloosa darter in particular by restoring the free-flowing nature of streams that were impounded by beaver dams.

Non-consumptive outdoor recreation poses potential impacts associated with public disregard of signs indicating areas of avoidance. NRS installs pole and cable barriers with signs to stay out at darter restoration sites, but there are documented areas where recreationists have gone around these barriers and damaged berms and vegetation, causing excess sedimentation. NRS will continue to install these barriers in an attempt to limit access. Vegetation at some canoe access points has been killed by repeated trampling, leaving the soil bare to erosion. Localized sedimentation may smother habitat, but suitable habitat is located up and further downstream at the canoe access points on Eglin streams. While there may be incidental interaction between protected aquatic species and anglers and boaters, these activities are not likely to negatively affect any sensitive aquatic species.

Fish pond management and recreation at Anderson Pond may affect the Okaloosa darter downstream from the pond. Typical levels of recreational use are unlikely to damage riparian vegetation, but concentrated traffic (i.e., if the Youth Fishing Rodeo is moved to this site), there would be the potential for erosion issues if riparian vegetation were trampled. To minimize this, NRS personnel would be present at the rodeo to keep participants out of sensitive areas. Although not presently occurring, if aquatic weed control became necessary then the NRS would conduct a separate consultation to address impacts.

Recreation management would not cause significant negative impacts to the Okaloosa darter, Florida bog frog, freshwater mussels, or Gulf sturgeon.

Bald Eagle. Fishing activities and non-consumptive outdoor recreation pose potential impacts associated with disturbance of nesting activities from human presence near the eagle's nesting tree. A posted 330 ft buffer would serve to deter public access near the nest on Main Base. Although the two bald eagle nesting areas are not currently posted at Cape San Blas, fishing activities and non-consumptive outdoor recreation are not likely to occur near eagle nesting habitat as the areas are naturally inaccessible to the public. The buffer area would be posted if Natural Resource personnel noticed an increase in the public use of that area. Recreation activities would not have a significant impact on the bald eagle.

Cladonia. Non-consumptive outdoor recreation poses potential impacts associated with public disregard of signs indicating areas of avoidance. *Cladonia* habitat is posted on an as-needed basis, but at least annually, to discourage access to the areas. However, some recreationists are likely to go around the posting. Thus, continued non-consumptive outdoor recreation may negatively affect the lichen, but these impacts would not be significant.

Piping Plover and Critical Habitat. Unauthorized access to plover habitat by recreational users may cause birds to temporarily flush from the area, and could damage critical habitat. For piping plovers and piping plover critical habitat on CSB, potential impacts could vary depending on the

number and frequency of vehicle or human encounters with plovers on the CSB beach, which is open to public recreation, including beach driving. Potential piping plover areas on CSB are posted in order to prevent people and vehicles from disturbing foraging and roosting behaviors. Vehicles would cause some rutting within the beach area, but as vehicles are not permitted to drive in posted protected roosting areas (dunes) and must drive above the intertidal/saturated areas of the beach two of the piping plover primary constituent elements), the disturbance would be minor to plover habitat. At SRI, piping plover critical habitat is located within the restricted access portion, but potential impacts may arise with public disregard of signs indicating areas of avoidance. Even through numerous postings for sensitive species are erected each year, Eglin NRS cannot prevent all persons from entering these areas. Unauthorized activities that may affect the piping plover are not addressed in this biological assessment. Eglin will continue to post piping plover critical habitat for avoidance. Because disturbance would be temporary and localized in nature, these activities would cause minimal harassment to piping plovers and no direct impacts are expected. Therefore beach driving and other recreational activities (i.e., walking or fishing) may negatively affect the piping plover or piping plover critical habitat at CSB or SRI, but impacts would not be significant.

Sea Turtles. Non-consumptive recreation and fishing on the public access portions of SRI and CSB, and beach driving at CSB, may negatively affect sea turtles through dune degradation, nest disturbance/destruction, human presence, and disorientation or misorientation of nesting adults and hatchlings due to lights. Impacts could be minor to severe depending on the number and frequency of human encounters with turtles. To minimize these impacts at SRI, the NRS posts signs of recreational hours at official beach access points, and also posts sea turtle nests for avoidance at both SRI and CSB. Sand dune sledding, night camping, and campfires are restricted on SRI and CSB beaches. Potential impacts to sea turtles from recreation were analyzed in the 2002 INRMP BA. Conservation measures should minimize impacts from authorized recreational activities (i.e., walking, fishing), thus recreation impacts to sea turtles would not be significant on SRI beaches open to public access.

Eglin has installed gates to restrict access to Eglin beaches at night during sea turtle season. Beach driving is allowed (with a permit from Gulf County) during daylight hours on a non-interference basis, but is prohibited on Eglin AFB property at CSB after sunset from May 1 through October 31 to prevent interference with turtle nesting. Eglin has also instituted a program of rut removal before sunset when nests are close to hatching to avoid stranding of hatchlings. These conservation measures should minimize impacts from nighttime CSB beach driving, while daytime beach driving and other recreational activities (i.e., walking, fishing) may negatively affect sea turtles on the three miles of Eglin CSB beaches, with impacts similar to those analyzed for SRI in the 2002 INRMP EA. Although negative impacts are likely, these impacts would not be significant.

Santa Rosa Beach Mouse. Non-consumptive outdoor recreation poses potential impacts associated with public disregard of signs indicating areas of avoidance. Even through numerous postings for sensitive species are erected each year, Eglin NRS cannot prevent all persons from entering these areas. Unauthorized activities that may affect the beach mouse are not addressed in this environmental assessment. Recreation management would not significantly impact the Santa Rosa beach mouse.

Shorebirds. Potential impacts from recreation would depend on the number and frequency of human encounters. It is likely the birds would flush from the area, possibly causing stress, but the birds would be expected to simply move on to undisturbed foraging areas during the course of the activity and return to the area once the general disturbance is over. Because disturbance would be temporary and localized in nature, these activities would cause minimal harassment to shorebirds and no direct impacts are expected. Nesting shorebird areas at SRI would be posted, however potential habitat impacts may arise with public disregard of signs indicating areas of avoidance. Eglin NRS cannot prevent all persons from entering these areas. Unauthorized activities that may affect shorebirds are not addressed in this environmental assessment. Overall the Proposed Action would not significantly impact shorebirds at SRI or CSB.

3.4.2.2 No Action Alternative

Prescribed Fire

Prescribed fire impacts to biological resources would be similar to those identified for the Proposed Action. Due to the UXO policy change, the No Action Alternative would be required to follow the same restrictions in the No and Restricted Suppression areas now in place (i.e., no RCW monitors during active fire). Burn acreage would be slightly less under the No Action Alternative, but priority areas for burning would still be identified using the Burn Prioritization Model. Prescribed fire would not result in significant negative impacts to biological resources, and would have an overall beneficial effect.

Wildfire Support

Wildfire support impacts to biological resources would be similar to those identified for the Proposed Action. Wildfire support under the No Action Alternative would have to respond to the same level of wildfires as for the Proposed Action and would be required to follow the same restrictions in the No and Restricted Suppression areas now in place (i.e., no plowing in UXO areas, no RCW monitors during active fire). However, under the No Action Alternative, no additional firefighters would be hired to handle the increase in wildfires, which would likely result in additional negative impacts to certain sensitive habitats and species (i.e., RCW) due to damaging wildfires. Although negative impacts would occur, wildfire support under the No Action Alternative would not result in significant negative impacts to biological resources.

Forest Management

Potential effects of forest management to natural communities, wildlife, and sensitive habitats would be similar to those for the Proposed Action. However, under the No Action Alternative fewer areas would benefit from sand pine removal TSI and longleaf planting, and more areas would have herbicide TSI. Sand pine removal activities may not occur at a rate sufficient to prevent the spread of sand pine into natural communities, potentially resulting in degradation of certain habitats. Additionally, the coordination process for forestry operations in special natural areas would not be formalized to ensure that special considerations for these areas are incorporated into forest management operations. Thus, there would be greater potential for degradation of RCW habitat and special natural areas, and increased potential for impacts to non-target resources from herbicides. However, overall forest management activities under the No Action Alternative would not result in significant negative effects to sensitive species or habitats,

and would result in long-term beneficial effects by reducing invasive sand pine and replanting with longleaf pine.

Habitat Restoration

Potential impacts to natural communities, wildlife, and sensitive habitats and species from habitat restoration under the No Action Alternative would be similar to those described for the Proposed Action. Habitat restoration activities would not result in significant negative impacts to biological resources, and would provide overall beneficial effects through INPS control and erosion site restoration.

Invasive Non-native and Nuisance Animal Management

Potential impacts of invasive non-native and nuisance animal control efforts to natural communities, wildlife, and sensitive habitats and species under the No Action Alternative would be similar to those described for the Proposed Action. Non-native animal management activities would not result in significant negative impacts to biological resources, and would provide overall beneficial effects through feral hog and coastal predator control.

Ecological Monitoring

Potential impacts from ecological monitoring to natural communities, wildlife, and sensitive habitats and species under the No Action Alternative would be similar to those described for the Proposed Action. Ecological monitoring would not result in significant negative impacts to biological resources, and would provide overall beneficial effects through improved understanding of natural resource responses to management activities.

Protected Species Management and Monitoring

Potential impacts from protected species management and monitoring to natural communities, wildlife, and sensitive habitats and species under the No Action Alternative would be similar to those described for the Proposed Action, except for the lack of additional monitoring for the gopher tortoise and freshwater mussels. By not expanding monitoring for these species, Eglin would be without the information necessary to inform management actions to minimize negative impacts, and would thus be vulnerable to increased restrictions from the USFWS upon listing of these species. Additionally, no mid-story hardwood control would occur in salamander ponds, leaving some ponds in a degraded condition. Overall, protected species management and monitoring would have no significant negative effects on biological resources, and would result in long-term beneficial effects by reducing negative impacts in habitats (due to posting) and provided information on species status to inform management decisions.

Recreation Management

Potential impacts from recreation management to natural communities, wildlife, and sensitive habitats and species under the No Action Alternative would be similar to those described for the Proposed Action, with continued impacts to certain sensitive species and habitats associated with unauthorized recreational access and inadequate conservation law enforcement. However, overall recreation management would not significantly affect biological resources.

3.5 LAND USE

3.5.1 Affected Environment

The diverse combination of natural, capital, and human resources at Eglin AFB provide a unique environment for accommodating a variety of military missions. Eglin provides support for not only Air Force operations, testing, and training, but Army and Navy as well. Mission activities on the Eglin Reservation can be categorized as follows: weapons system research, development, testing, and evaluation; training; space operations; and base and range support. Eglin has over 464,000 acres of land range with 50 land test areas, manages the Joint Gulf Range Complex, and 142,000 square miles of overland and overwater airspace, allowing for a sea-to-land transition area necessary for modern weapons system research, development, testing, and evaluation. Cape San Blas (CSB) and the adjacent nearshore waters (out to three miles) of the Gulf of Mexico is also included in Eglin's footprint for land use and natural resources management.

The land uses surrounding Eglin AFB are interrelated with the mission activities that occur on the base. The ROI for land includes Eglin AFB, the counties of Okaloosa, Walton, Santa Rosa, and Gulf, and the local jurisdictions within these counties. The area south of Eglin AFB is primarily commercial and urban residential land. West, north, and east of Eglin AFB, land uses are more rural and less constrained. Regional land uses include:

Recreation/Natural Resources Management Areas – Multiple natural areas exist in close proximity to Eglin, with representative high quality aquatic and terrestrial habitats. These areas include state forest land, numerous state recreation areas, national seashore, water management district lands, as well as Girl Scout and Boy Scout camps.

Residential – For many cities located along Eglin's southern boundary, urban residential (as well as commercial) development is limited to parcels existing within the urbanized areas (infill development). The remainder of the region is open to rural residential development.

Mixed Use – Mixed use areas include a combination of residential, nonresidential, and commercial uses, and are dispersed throughout areas surrounding the Eglin Reservation. A large tract of mixed use area is located near the eastern portion of Destin between U.S. Highway 98 (State Road [SR] 30) and the Choctawhatchee Bay toward Walton County.

General Commercial – Areas for conducting business activities for profit such as retail sales, services, and offices. Most areas designated for general commercial in the ROI are adjacent to major roads including SR 189, Lewis Turner Blvd., SR 188 (Racetrack Road), U.S. Highway 98, and SR 293.

Agriculture/Timber – Major tracts of undeveloped land west, north and east of the base are owned by timber companies or used for agriculture.

Institutional - Areas for civic, government, religious, or non-profit uses such as government grounds, buildings, and activities; public and/or private schools, colleges; libraries, museums, public health facilities, etc.

Future land use for most areas of the ROI consists primarily of agricultural, military, or preservation land uses, except in established municipalities or along coastal areas. In these areas, urban (e.g., residential and commercial) land uses dominate. The ability to house a growing

labor market, and provide jobs and civil infrastructure (hospital, schools, roads, etc.) will place increased pressure on Eglin AFB leadership to discover collaborative solutions to the inevitable encroachment.

Recreation

The NRS strives to provide quality and affordable outdoor recreational opportunities to the public for their enjoyment. It is not an objective for the Outdoor Recreation program to generate maximum revenue but to maintain an income base from permit sales suitable to maintain self-sufficiency of the program. This is necessary since the only financial contribution to the program from the base is funding for staff salaries.

There are various public recreational activities that take place in the interstitial area of Eglin AFB (Figure 3-13). There are approximately 280,000 acres of land open for outdoor recreation. Outdoor activities include hunting, fishing, hiking, and camping, the most popular being hunting and fishing. An average of approximately 16,000 recreational permits is issued each year. The Eglin reservation is closed to all public use and access from 2 hours after sunset until 2 hours before sunrise except for these authorized activities: 1) camping in designated campsites, 2) fox, raccoon, and opossum hunting 15 May-15 June season, 3) retrieving lost dogs in dog hunting areas until 8:00 PM during the general gun and 1-7 November dog training season, and 4) gigging north of RR 211 between SR 85 and 87 during the period of 1 May - 1 September.

Air Force Instruction 32-7064 requires the classification of Air Force managed property into the following categories to describe outdoor recreation opportunities.

Class I – Areas (general outdoor recreation areas) suitable for intensive recreational activities such as camping, winter sports, and water sports.

Class II – Areas (natural environmental areas) that can support dispersed recreational activities such as hunting, fishing, birding, hiking, sightseeing, jogging, climbing, and riding.

Class III – Areas (special interest areas) that contain valuable archeological, botanical, ecological, geological, historic, zoological, scenic, or other features that require protection

The vast majority of Eglin's 280,000 acres open to outdoor recreation are classified as Class II areas.

At the present time the only Class III area on Eglin AFB is located on Okaloosa Island. The portion of the island south of U.S. Highway 98, east of Air Force Site A-3 and west of the Eglin Beach Community Center contains a significant portion of the range of the federally endangered perforate reindeer lichen (*Cladonia perforata*). Due to adverse affects to this species associated with pedestrian trespass, the perimeter of this area was fenced with 2.5 miles of sand fencing and posted with no trespassing signs. The purpose of the fence and signs was to deny pedestrian entry from U.S. Highway 98 and along the established beach access sites. Another portion of the island adjacent to the East Pass is maintained as a shorebird nesting area, and signs are posted to prevent public entry. In addition to these areas, there are many other areas on Eglin that contain rare and sensitive plant and animal communities. However, these areas are not impacted by foot traffic or recreational use other than illegal or unauthorized motor vehicle use.

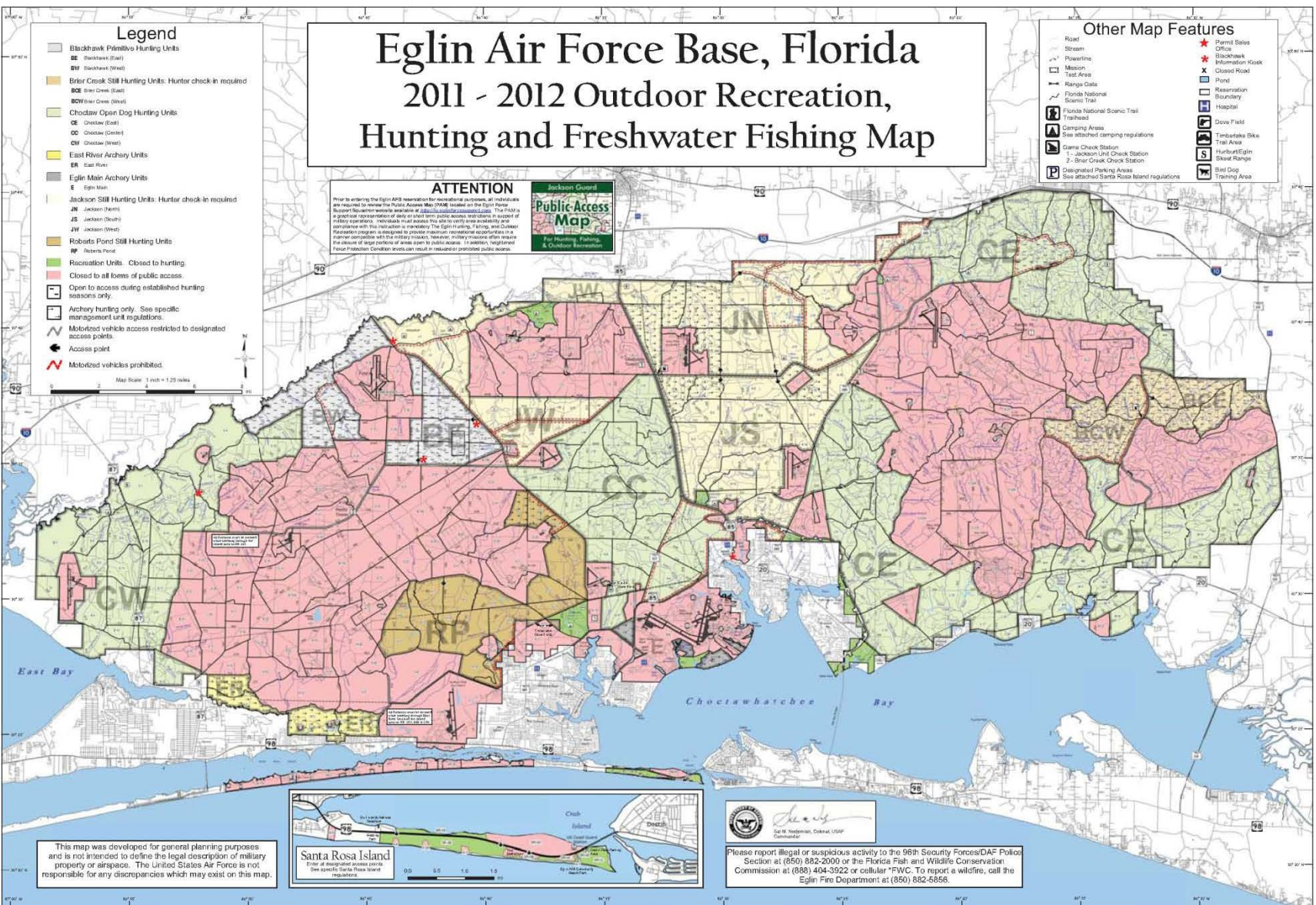


Figure 3-13. Recreation Areas of the Eglin Reservation

Air Force Instruction 32-7064 also requires classification of Air Force managed lands into one of five categories associated with the degree of public access for all areas identified as suitable for outdoor recreation.

Category A – Open to the general public regardless of association with the military or other DOD agencies.

Category B – Open to DOD employees, guests, family members, and retirees only.

Category C – Open to installation personnel and guests, permanent change of station or temporary duty personnel, and their family members only. This category does not include retirees or DOD employees from other installations or military services not on permanent change of station or official temporary duty, except as guests.

Category D – Open to installation military and civilian personnel only. This category includes only those personnel assigned permanent change of station or official travel duty at the installation. It excludes family members, guests, retirees, and other DOD employees.

Category E – Closed.

An installation or area may have multiple designations. For example, an area may be designated Category E for hunting and Category A for fishing. Category E areas on Eglin include buffer areas adjacent to active test and training ranges that are frequently within recurring test and training mission safety profiles, test ranges and associated administrative areas, areas with sensitive security concerns, areas with UXO concerns, and other areas such as sewage sprayfields and landfills.

The NRS has taken two approaches to periodically open portions of the installation normally closed to hunting (Category E areas). One approach has been the establishment of conditional hunting areas such as the Briar Creek Still Hunting Unit. This area falls within the safety footprints of large missions that occur primarily on weekdays. Mission activity permitting, the area is open to walk-in hunting on weekends and holidays through the use of a manned hunter check station. The second approach to manage limited hunting in portions of Eglin's closed areas is through the use of special, controlled hunts closely supervised by Natural Resources personnel. For the past several years, the NRS has managed hunts for mobility impaired hunters and for youth hunters.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

Recreation Management

Under the Proposed Action, the primary change in management includes a shift in land use from recreation to closed area, as reflected in the 2005 BRAC decision. The 2005 BRAC action includes a beddown of the 7SFG(A) requiring development of a cantonment area and training ranges, and implementing of 7SFG(A) training activities on the Eglin Reservation (U.S. Air Force, 2008). To accommodate the 7SFG(A), some areas were converted from recreation to closed areas. Therefore, under the Proposed Action, the land area available for hunting will

decrease by 48,106 acres or approximately 16% from the baseline. Of that, 44,729 acres of dog hunting area would be lost, a reduction of approximately 25 percent.

However, there will be no adverse impacts to land use, since it would remain compatible with the existing land uses. However, the public, particularly dog hunters, may perceive the change as an adverse reduction in the total amount of area open for public access and outdoor recreation within the interstitial area of the Eglin Range.

Coordination between military activities and recreational activities occur in advance to eliminate potential interference and impacts from multiple land usage. Under the Proposed Action, Eglin would maintain compatible use between recreation and the military mission (U.S. Air Force, 2012). Continued coordination of public land use with the military mission will also be enhanced through the implementation of the Public Access Map usage system. Furthermore, to minimize potential impacts to land use and recreation, several management requirements will be employed. These include: maximizing mission activities in areas that are already permanently closed to the public, reporting violations of any recreational rules to the appropriate authorities, and submitting a mission request in advance and having prior approval and scheduling before dispensing chaff.

3.5.2.2 No Action Alternative

Under the No Action Alternative, land use at Eglin AFB would remain consistent with current land uses. Military and recreational use would remain the primary uses. Therefore, there would be no significant impact to land use and recreation under the No Action Alternative.

3.6 SAFETY AND RESTRICTED ACCESS

3.6.1 Affected Environment

Definition of Resources

Safety is defined as any issue with a potential to increase health risks to military or DoD civilian personnel, developer personnel, or the general public. This section addresses the potential safety concerns associated with the Proposed Action.

A variety of Air Force regulations address or govern safety, including Air Force Instruction (AFI) 91-301, Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Standards. Under Title 29 CFR 1960 series, Occupational Safety and Health Administration (OSHA) standards do not apply to military-unique workplaces, operations, equipment, and systems. However, according to DoD instruction, they will be followed insofar as is possible, practicable, and consistent with military requirements. AFOSH standards apply unless specifically exempted by variance or determined to be an acceptable deviation. Safety also considers the potential for encountering unexploded ordnance (UXO).

Existing Conditions

Wildland Fire and Firefighter Safety

To ensure firefighter safety, several national requirements including the National Wildfire Coordination Group (NWCG) Wildland Fire Qualification System Guide (310-1) guidelines are in practice (NWCG, 2011). Safety procedures are detailed in the Eglin AFB Wildland Fire Management Plan (WFMP), which is mandated by AFI 32-7064 and is an appendix to the INRMP. Firefighters may use all-terrain vehicles (ATVs) in the conduct of managing wildland fires, and Eglin AFB has rules and regulations in place to maximize ATV safety.

A critical consideration in the operation of the wildland fire management program is the issue of UXO. Eglin AFB has been used as a munitions test range for over 60 years, and large areas of the base may contain UXO. This UXO can explode during fires or fire suppression efforts, and for this reason, some areas are designated as a “no suppression” zones. In these areas, no personnel are allowed to be present during active fire, either prescribed fire or wildfire, and fire management activities are limited to using and maintaining existing roads as fire breaks. In a fire “no suppression” zone, firefighters do not suppress fire using engines, tractors, or hand tools. Areas that may be contaminated with UXO, but to a lesser extent than no suppression zones, are designated as “restricted suppression” zones. Fire suppression in these areas is limited to times of elevated fire danger or when allowing a fire to burn could be more detrimental to firefighter safety than suppression (U.S. Air Force, 2011c). Under the Proposed Action, maps detail all limited suppression areas, including the “no suppression” and “restricted suppression” zones. Figure 3-11 illustrates the “no suppression” and “restricted suppression” zones under the Proposed Action.

Wildland Fire and Public Safety

In order to best respond to wildfires, the Eglin Reservation has been delineated into four fire management zones (FMZs). The areas for these zones are based on the potential frequency of recurring fires, the vegetative components in the areas, and the potential threat to humans and infrastructure. As applied to personnel safety, FMZs 1 and 2 are in the open areas of the Eglin reserve, where human population is limited to people transiting on the range or recreational users of the base’s open areas. The various test areas on Eglin AFB make up FMZ 3, and these areas may or may not have personnel working in them, depending on the area and the scenario. FMZ 4 includes all improved areas, including Eglin Main Base Complex, Hurlburt Field, Duke Field, Site C-6, Navy Explosive Ordnance Disposal (EOD) School, Dillon Field, the 7th Special Forces Group (SFG) compound, and Camp Rudder (Army Ranger Camp). This zone is a full suppression area, due to the risk to safety posed by wildfires in these areas.

Approximately 73 percent of wildfires on Eglin are caused by mission activities, and the majority of these wildfires occur in areas closed to the public. Since most wildfires are in off-limits areas, there is very little risk to the visiting public. During a wildfire, public use areas that are threatened would be closed. Occasional wildfires, typically started by illegal activities (i.e., campfires, arson) at the urban interface, can threaten residential and industrial areas. To reduce potential impacts, the NRS prioritizes prescribed burns in these areas to reduce fuel and provides maximum resources in the case of any wildfires, in cooperation with local fire departments.

When a prescribed burn is scheduled to occur in an area open to the public, the burn area is posted the day before the operation whenever possible. Areas scheduled for prescribed fires are posted on the PAM as temporarily closed for that day. If the burn is to be ignited from a helicopter, personnel in the helicopter will scout the burn area prior to ignition to ensure no one is inside the burn area. If the burn is ignited from the ground, the perimeter of the burn area will be driven prior to ignition to find any vehicles or other indicators of visitors inside the burn area. Any person found inside the burn area will be asked to leave prior to ignition of the area.

Before and during prescribed burn activities, the issue of smoke management is analyzed and monitored using the best technology available. Smoke from a prescribed burn could pose a risk to safety, primarily by obscuring vision on roads. Computer modeling of potential smoke plumes uses inputs from spot weather reports, on-site weather stations, and Eglin's 96th Weather Squadron to provide the most accurate predictions of smoke propagation possible. If smoke from a prescribed fire or a wildfire becomes a hazard to public safety through the obscurement of vision on local roadways, measures will be taken to mitigate the potential threat. These measures may include posting signs to warn drivers of the smoke hazard or even closing roads and rerouting traffic if necessary.

Invasive Non-native and Nuisance Animal Species Management

Invasive non-native and nuisance species are a potential threat to public safety in several ways. These species can carry and spread diseases and parasites, many of which can infect humans. These diseases include leptospirosis, brucellosis, pseudo-rabies, bovine tuberculosis, hog cholera, trichinosis, foot and mouth disease, African swine fever, rinderpest, and anthrax. Among the parasites these species may host include tapeworms, swine kidney worms, lungworms, roundworms, hookworms, ixodid ticks, and coccidian. The excrement of these animal species can be a source of disease-causing bacteria in runoff water.

These species can pose a direct hazard to human safety through aggressive behavior upon contact. An example of this is an individual encountering a nest of RIFA and being stung, which can be fatal under rare conditions. Another example of a hazardous encounter is an automobile accident caused by striking or avoiding a black bear on a highway, which happens infrequently in the area.

The Bird/Wildlife Air Strike Hazard (BASH) Program on Eglin AFB reduces the potential for birds and wildlife to cause damage to aircraft and death or injury to human life. Personnel use several methods, both passive and active, to limit the hazards from potential bird/wildlife strikes. Another management practice that supports Eglin's BASH Program is proper animal carcass management when possible. Carcass burial or relocation minimizes the feeding and convergence of scavenging birds and raptors, which are among the costliest types of birds involved in U.S. Air Force bird strikes (U.S. Air Force, 2010).

Habitat Restoration and Forest Management

The management of invasive non-native plant species may include the use of herbicides. As discussed in Section 3.7.2, herbicide use would be conducted in accordance with the manufacturer's instructions in remote areas with little chance of public interaction. Application sites in public use areas are posted.

Because ground-disturbing activities also occur as part of erosion control and forest management activities, crews receive briefing on UXO before beginning work, and UXO brochures are distributed. Crew members must sign the UXO training roster.

Recreation Management

The Eglin NRS manages the public permitting program for recreational activities on Eglin AFB. Recreational, hunting, and fishing permits are required for anyone 16 years or older entering Eglin AFB and may be obtained from NRS. Those persons hunting, fishing, or in possession of equipment used for these activities must have applicable state and federal licenses, stamps, and permits (U.S. Air Force 2011) as well. Since September 2000, Eglin recreational users have been provided a map depicting areas with known, probable, and possible UXO contamination and required to view a five-minute UXO awareness and safety video prior to any permit sales. A UXO awareness and safety brochure is available and is given to each customer purchasing a permit for other persons and for customers purchasing permits through the mail. Informational UXO caution signs have been posted at all major roads entering the installation from public highways.

To date, there have been no UXO safety incidences involving recreationists or commercial timber contractors. However, UXO incidents on Eglin have involved military personnel tampering with, or improperly handling, UXO in areas not open to public recreation or NRS personnel during wildfire suppression activities adjacent to current active ranges. Neither of these instances involved serious injury.

Portions of the reservation normally open to public recreation are sometimes temporarily closed to support Eglin's dynamic test and training mission. The frequency of these closures has increased in response to ever-increasing standoff capabilities of modern weapon systems. These closures usually are of a short duration and are announced in advance to the public through local media channels. In addition to interfering with mission capabilities, open and uncontrolled public access from hundreds of entry points has led to numerous environmental problems, including illegal dumping, poaching, introduction of invasive exotic species, and erosion from unauthorized motor vehicle use.

All persons that engage in outdoor recreational activities are required to adhere to applicable Eglin AFB, federal, and state laws, rules, and regulations (Florida Game and Fresh Water Fish Commission, 1997). General regulations are in place that address prohibited actions; for example, disturbing or removing any government property from the Eglin Reservation. Entry into both "closed" areas and "seasonally closed" areas is prohibited unless special permission has been granted by the Commander, Eglin AFB. Areas designated as "open," such as the east end of Okaloosa Island, are available for all types of outdoor recreation with the exception of hunting. All rules and regulations for recreational activities can be obtained from Eglin AFB NRS (U.S. Air Force 2011).

There has been an increase recently in military test mission tempo, and new ground maneuver training requirements have led the NRS to improve and update outdoor recreation access procedures and policy. Eglin is divided into 412 sub-compartments known as Tactical Training Areas (TTAs). Each TTA has an average size of 1,130 acres. Prior to entering the reservation, all recreationalists must first view the daily public access map (PAM) to verify area availability.

The PAM informs the public via the Internet of short-term closure of open recreational areas. The PAM is a website showing a map of Eglin AFB with the current day's closure information, as well as a three-day forecast. Prior to entering the Eglin Reservation, all recreationalists must first view the PAM to verify area availability. The PAM is available at <http://jg.eglinforcesupport.com/#>.

The greatest public demand for Eglin's land areas historically has been for hunting. Hunting and fresh water fishing on Eglin AFB follows the general state laws and regulations outlined in the *Florida Hunting and Fresh Water Fishing Handbook*. Additional rules and regulations specific to the Eglin Reservation are detailed in the annual Eglin AFB Outdoor Recreation, Hunting, and Fresh Water Fishing Map and Regulation product. This product also outlines additional fresh water fishing regulations specific to Eglin AFB. In addition to hunting and fishing, the public uses Eglin AFB for general outdoor recreation, which includes canoeing, hiking, bicycling, picnicking, nature study, swimming, and berry picking. Public access is restricted in certain areas where sensitive habitats are posted and fenced, particularly at SRI and CSB.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

Prescribed Fire

Under the Proposed Action, personnel would follow safety standards and practices detailed in the WFMP. The qualification guidelines in the NWCG would be applied to the training and qualifications of firefighting personnel. The Air Force does not expect any adverse impacts to safety under the Proposed Action.

Wildfire Support

Under the Proposed Action, Eglin's wildland fire program would adhere to the guidelines of the NWCG. Fire management personnel would follow the qualification and training standards of the NWCG Wildland Fire Qualification Subsystem Guide to attain and maintain certification. The use of the Wildland Fire Suppressions Considerations Maps and conscientious decision making with regard to the degree of suppression to be used based on the scenario would improve safety to firefighters and the public. The practice of closing public areas and restricting public access to off-limits areas would maintain public safety from wildland fires on Eglin AFB. The Air Force does not anticipate any adverse impacts to safety under the Proposed Action.

Invasive Non-native Animal and Nuisance Species Management

Although feral hogs can be dangerous, the likelihood of potentially unsafe human encounters with harmful wildlife is minimal. The NRS would continue feral hog control measures, further reducing potentially dangerous encounters. The Air Force does not anticipate any adverse impacts under the Proposed Action.

Habitat Restoration and Forest Management

The potential use of herbicides could present a hazard to public safety. Under the Proposed Action, NRS would follow requirements from the LVC EA and would post herbicide areas, thus

minimizing potential safety impacts. Crewmembers would be briefed on UXO prior to work, and brochures on UXO would be distributed. The Air Force does not anticipate any adverse impacts under the Proposed Action.

Recreation Management

The introduction of the TTA concept and the subsequent creation of the PAM are major improvements to the process of controlling public access. The daily availability of closure information to the public, including the three-day forecast, would enhance safety by limiting access from potentially unsafe areas.

3.6.2.2 No Action Alternative

Under the No Action Alternative, acreages and recreation categories would be the same as under the Proposed Action, and wildland fire personnel would follow the Wildland Fire Suppressions Considerations map. However, the PAM would not exist to indicate temporarily closed areas, thus potentially requiring Eglin to either permanently close additional areas to public recreation, or to concentrate missions into already closed areas. Overall, impacts to restricted access and safety would be similar to those under the Proposed Action.

3.7 CHEMICAL MATERIALS/DEBRIS

Chemical materials and debris are considered in this section. Chemical materials include substances that are released to the environments of Eglin mainland, Santa Rosa Island, or Cape San Blas as a result of natural resources management decisions and activities. These substances may include hazardous materials and hazardous wastes, although not all chemicals potentially released would be considered hazardous. Hazardous materials listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA) are defined as any substances that, due to quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Hazardous wastes listed under Resource Conservation and Recovery Act (RCRA) are defined as any solid, liquid, or contained gaseous or semisolid wastes that pose a substantive present or potential hazard to human health or the environment. Debris refers to solid materials (usually non-hazardous) that are deposited on the surface of terrestrial or aquatic environments.

Eglin AFB has implemented a comprehensive Hazardous Material Management Process for managing hazardous materials. Hazardous material management is guided by Air Force Instruction 32-7042 (U.S. Air Force, 2009). All Eglin AFB organizations and tenants are required to follow this plan. In addition, Eglin has implemented a Hazardous Waste Management Plan, Air Armament Center Instruction 32-7003 (U.S. Air Force, 2006). This plan identifies hazardous waste generation areas and addresses proper packaging, labeling, storage and handling, record-keeping, spill contingency and response requirements, and education. Procedures and responsibilities for responding to a hazardous waste spill or other incident are also described in the Eglin AFB *Spill Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2005).

3.7.1 Affected Environment

Chemical materials potentially associated with INRMP implementation include herbicides, fire retardants, and petroleum products. Herbicides would be used in a variety of applications, including hardwood control for improving habitats of the RCW, reticulated flatwoods salamander, and other species; longleaf pine restoration and reforestation actions; and invasive non-native species management. The types of vegetation controlled by herbicides typically include, but are not limited to, live oak, laurel oak, turkey oak, sand pine, slash pine, and waxy shrubs such as gallberry, greenbrier, and wax myrtle. An herbicide contains active ingredients as well as adjuvants. Adjuvants are compounds added to the solution, such as surfactants or oil, that help the solution adhere to and spread over vegetation surfaces. Herbicides that would be potentially used with implementation of the INRMP are listed in Table 3-24. These chemicals would be primarily used on Eglin mainland and Santa Rosa Island, although there is potential for minor use on Cape San Blas.

Table 3-24. Herbicides Potentially Used on Eglin Air Force Base

Herbicide	Example Trade Names*
Hexazinone	Velpar™
Aminopyralid	Milestone™
Fluroxypyr	Vista®
Fosamine	Krenite®
Glyphosate	Accord® XRT
	Rodeo® (aquatic)
Imazapic	Plateau®
Imazapyr	Arsenal®
	Chopper®
	Habitat® (aquatic)
Metsulfuron	Escort®
Sulfometuron methyl	Oust® XP
Triclopyr	Garlon® XRT

*Examples of common trade names are provided; however, herbicides may have multiple trade names

Herbicides could be applied by any of the following methods; however, it should be noted that aerial application is uncommon:

- Manual crew
- Foliar application (directed foliar application using hand-pump or motorized backpacks)
- Basal bark application
- Soil spots (basal or grid-pattern)
- Injection (including hack and squirt and the hypo-hatchet), cut-stump, and other ground applications
- Foliar application (foliar application using spray tanks on vehicles/ATVs/trailers and hoses)

- Broadcast (boomless applicator or spray boom mounted on a tractor, skidder, or other vehicle)
- Strip broadcast applications and aerial applications
- Helicopter or fixed wing, as allowed by label

The ability to carry out fire suppression actions is required at Eglin AFB because of the large number of military missions that can potentially start wildfires and the threat such fires can pose to military assets and urban areas near Eglin's boundary. The only chemical substances associated with fire suppression on Eglin are fire retardants. These substances are designed to affect the fire's fuel source by coating, modifying combustion reactions, and cooling (Forest Service, 2011a). Fire retardants are typically stored and mixed at an airtanker base, and may be delivered by airtanker or helicopter. The specific type used on Eglin would depend on the available inventory at the airtanker base. Currently, Phos-Chek is the supplier that would deliver fire retardant to be applied on Eglin. This supplier's retardants consist of fertilizer-type salts, coloring agent (for visual aid), corrosion inhibitors, and flow conditioners (Phos-Chek, 2008). Eglin would typically only use a retardant in the rare event that a fire threatened the urban interface. Fire retardant use is therefore infrequent, with the only documented application occurring one time in 1998.

Petroleum products refer to fuel, oil, and other lubricants that would be associated with the use of vehicles and other equipment upon INRMP implementation. A variety of vehicles and equipment, such as trucks, all terrain vehicles, chainsaws, and mowers, would be used by Eglin personnel or contractors during activities related to prescribed and wildfire management, forest management, habitat restoration, ecological monitoring, and protected species management. In addition, privately owned vehicles would be allowed onto portions of the Eglin mainland for hunting and non-consumptive recreation. Petroleum products could be deposited onto the ground or into surface waters as a result of engine leaks or other vehicle issues or repairs performed in the field. However, vehicles owned by Eglin are maintained and serviced on a regular schedule, and fluid leaks and other issues are not expected to pose a significant environmental risk. All spills would be contained and reported in accordance with Eglin policy. In addition, the amount of petroleum products potentially introduced by use of contractor or privately owned vehicles is not expected to be significant. Therefore, environmental impacts due to petroleum products associated with vehicle and other equipment use are not considered further in this document.

In the context of the proposed action, debris refers to litter and spent munitions associated with hunting, fishing, and non-consumptive recreational activities such as camping, biking, and wildlife viewing. Solid litter debris may be intentionally or unintentionally left by individuals engaging in these activities on the Eglin Reservation. Examples of litter include bottles, cans, and paper or plastic items. Lead bullets and shell casings would be expended on portions of Eglin mainland during hunting activities, resulting in the eventual introduction of lead and other metals into the soil and possibly surface or groundwater. However, the amount of debris associated with INRMP implementation is considered relatively minor. The volume of litter potentially generated by non-military, recreational users of the base is not expected to be great enough to adversely affect soils, water resources, or biological resources.

Approximately 5,000 to 6,000 hunting permits have been purchased annually over the previous few years. The total number of acres available for various forms of hunting would decrease slightly under the Proposed Action (Table 2-7), although this change would be unlikely to substantially affect the number of gun permits sold. The number of permit holders who ultimately fire a gun, and the total number of bullets expended for all permits, is unknown. However, millions of live cartridges are potentially fired on the various ranges of Eglin annually during military test and training missions, and analyses have concluded that the resulting concentration of metals in the soil would generally be well below Eglin background levels and U.S. Environmental Protection Agency risk-based concentrations (e.g., see U.S. Air Force, 2010). In addition, analysis of soil samples near some target berms on the base has shown that metal concentrations are below levels of concern (U.S. Air Force, 2000). Therefore, the incremental contribution of metal residues resulting from permitted hunting is considered insignificant, and impacts due to debris are not discussed further. Subsequent analyses will be limited to chemical materials.

The Environmental Restoration Program (ERP) is used by the U.S. Air Force to identify, characterize, clean up, and restore contaminated sites. Eglin has implemented an *ERP Management Action Plan* to track activities and progress associated with contaminated sites on the installation (U.S. Air Force, 2003c). ERP sites located on Eglin AFB are included in Figure 3-14 to Figure 3-16.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

Wildfire Support

Potential impacts of chemical materials related to wildfire support would result from use of fire retardants; however, fire retardants would only be used in emergency situations to protect military assets or private property, thus expected use would be infrequent (once every 10 to 15 years) and in a relatively small area. The U.S. Forest Service, in an Environmental Impact Statement currently in draft form, has evaluated potential impacts from retardant use on a nationwide scale on air quality, soils, plants, wildlife, water resources, and public health and safety, among other resources (Forest Service, 2011a). The conclusions are generally applicable to Eglin AFB actions, and are summarized here. There would be no effects to air quality. The retardant does not remain in the air long enough to be transported outside the immediate area. If vegetation sprayed with retardant should burn, nitrous oxides could be released. However, this potential is likely offset by the overall decreased amount of vegetation that would burn.

Aquatic species and terrestrial species with limited mobility could be exposed to fire retardants. However, the risks are expected to be minor, small in scale, and not affect more than a few individuals or a portion of a population. The material safety data sheets for retardants commonly supplied by Phos-Chek indicate that risks to wildlife would be minor, ranging from practically nontoxic to slightly toxic at various concentrations. No adverse effects resulting from animal ingestion of retardant-covered vegetation is reportedly known (Phos-Chek, 2008). Application would likely occur on only a small portion of the land base. In addition, retardant use at Eglin would take into consideration the location of sensitive species.

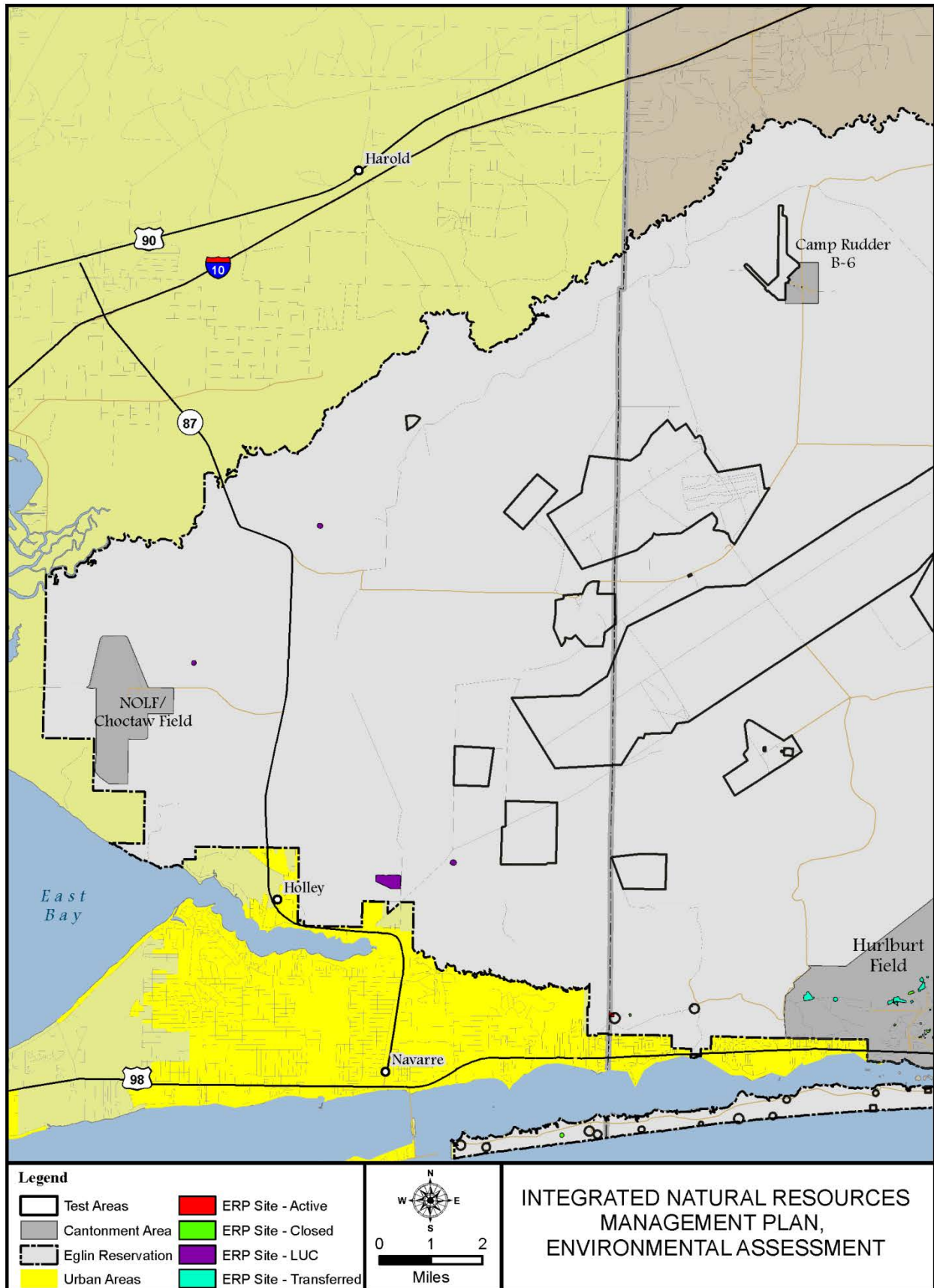


Figure 3-14. ERP Sites on Eglin AFB (West)

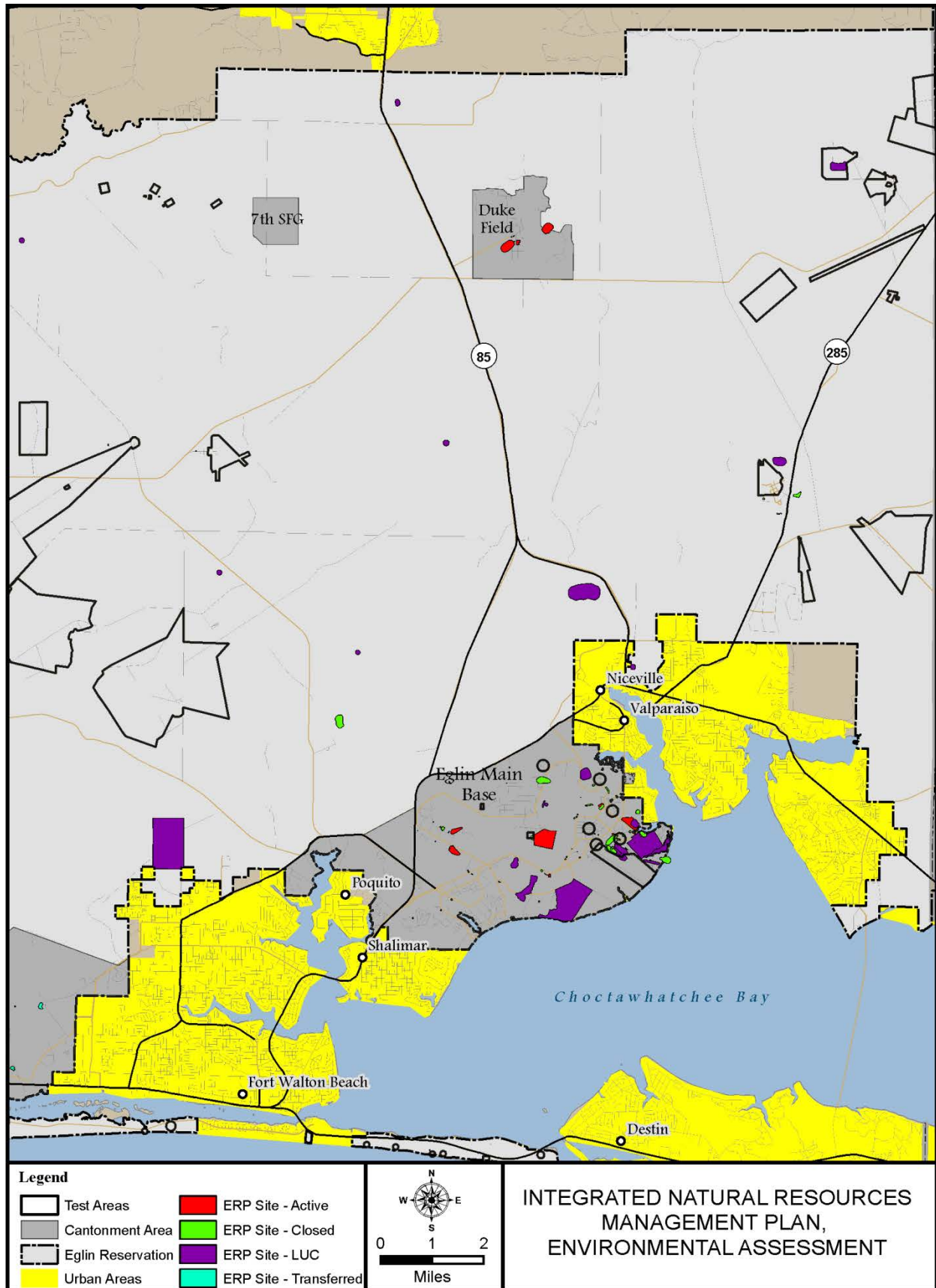


Figure 3-15. ERP Sites on Eglin AFB (Central)

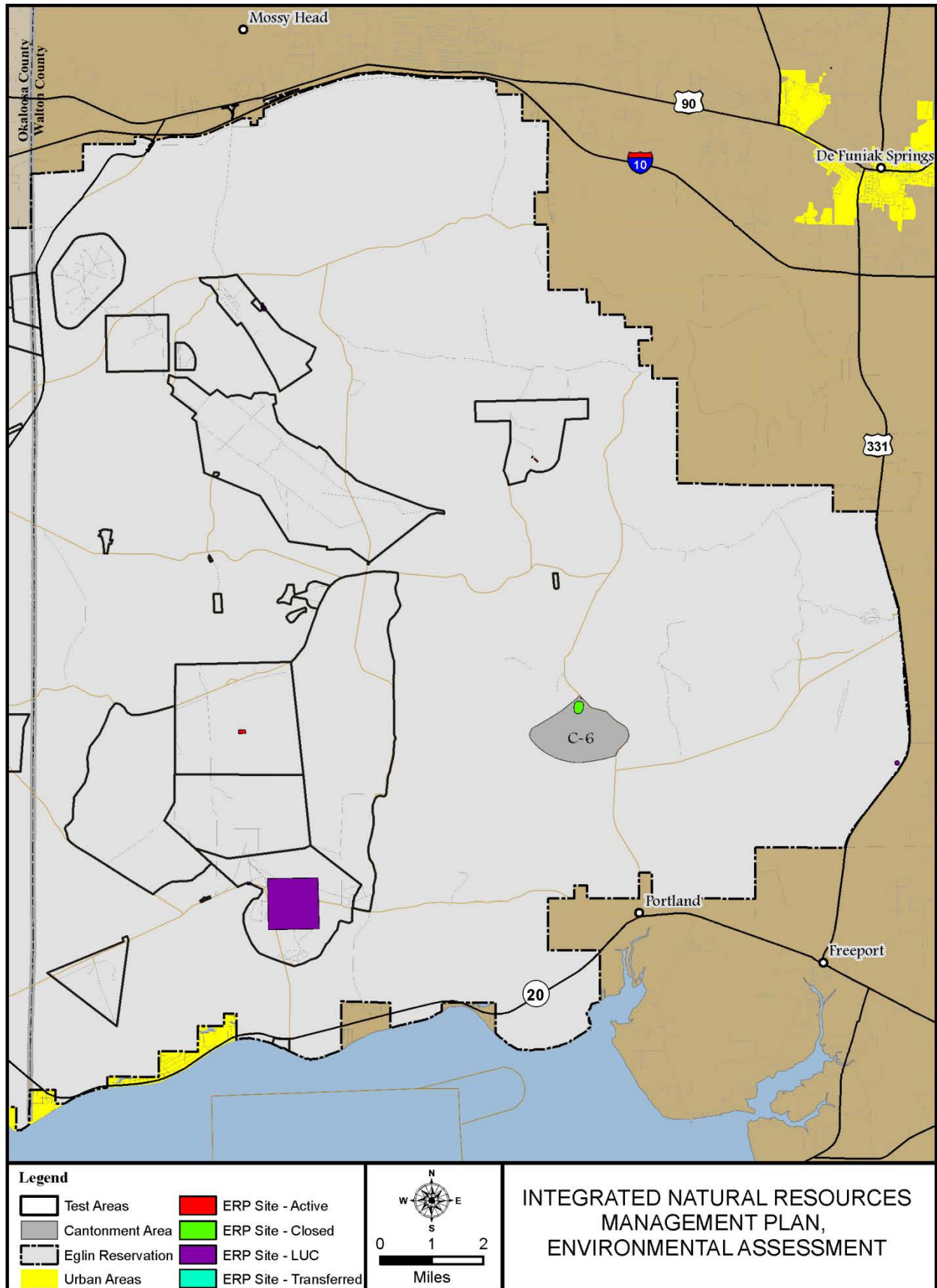


Figure 3-16. ERP Sites on Eglin AFB (East)

Fire retardants entering surface waters could adversely affect water quality. However, impacts are expected to be short-term, and downstream water movement would dilute chemicals. Eglin would take into consideration the location of sensitive aquatic areas such as wetlands when using fire retardants.

Potential effects to soil consist of a fertilizing effect (increased plant growth) and an acidifying effect, which could make some nutrients unavailable. Plant species could be impacted by the nitrogen and phosphorus components of fire retardants; effects from other constituents have not been identified. Effects on vegetation identified in various studies include decreased legume abundance and whole plant or leaf death (Forest Service, 2011b). In addition, plant community diversity could be affected because of the nitrogen and phosphorus associated with retardants acting as fertilizer. However, retardant use on Eglin is anticipated to be infrequent and relatively localized. Information provided by Phos-Chek indicates that impacts to vegetation from supplied retardants would be temporary and minor (Phos-Chek, 2008). Overall, impacts to soils and vegetation would not be significant.

Effects to human health resulting from retardant exposure would likely be limited primarily to skin or eye irritation. These effects are likely to be minimal. Inhalation effects are not expected, and any such effects would probably be less acute than those caused by smoke from unsuppressed fire near urban areas.

Forest Management and Habitat Restoration

Chemical materials associated with forest management and habitat restoration practices would consist of herbicides. Herbicides are obtained, stored, transported, used, and disposed of by contractor personnel. None of these materials are bought by Eglin or stored or disposed of on Eglin property. Herbicide would be used in accordance with manufacturer directions, including application methods and rates. Approximately 1,000 acres would be treated with herbicide under the Proposed Action. In addition, other timber management and restoration activities could include herbicide use (see Table 2-2). Herbicide use on Eglin AFB was analyzed comprehensively in the *Long-Term Vegetation Control for Eglin Air Force Base, Florida Final Environmental Assessment* (U.S. Air Force, 2007), which identified potential impacts to soils, water resources, air quality, biological resources, socioeconomic resources, environmental justice and risks to children, and safety. The results are applicable to this document, and are summarized below. Refer to the 2007 Environmental Assessment for a complete description of analyses. For potential impacts to the resources listed above, other than those resulting from herbicide use, refer to the applicable sections of this chapter.

Soils

Herbicide use could impact soils if repeated applications occur prior to the complete decomposition of previous applications. However, repeated applications are generally not prescribed. In areas where repeated applications of herbicides during a one-year span may be necessary, care must be taken to recognize any buildup of periodically persistent chemicals on a case-by-case basis. Such preventive action would prevent excessive leaching of chemicals through the soils, which would be expected due to the sandy particle matrix common to many areas on Eglin.

Water Resources

Herbicide contamination of water resources could result from leaching, stormwater runoff, or directly spraying a water body or wetland with an herbicide not labeled for water use. Major factors influencing herbicide movement from an upland site to surface water or groundwater include the herbicide's solubility in water, photo- or biodegradation characteristics, ability to bind with soil and organic matter, and ability to persist until reaching a water source. Aerial application of herbicides poses the highest hazard for surface water contamination, in that the herbicide can inadvertently be directly sprayed or drift into a water body. Wet, marshy areas generally contain higher levels of herbicides for longer periods of time than do upland areas. The half-life for herbicides typically used on Eglin range from one-half day to 10 weeks.

Surface runoff could also introduce herbicides to surface waters. Rainfall in northwest Florida may occur so quickly that the soil's absorption capacity is exceeded. If heavy rains fall in an area before the herbicides have been taken up by plants, there is the potential for runoff of herbicides to unintended areas, including water bodies. To minimize this potential, Eglin would time the application of herbicides to avoid upcoming rain events and establish buffer zones around water bodies. Additionally, Eglin would strictly follow the application instructions, which would maximize absorption by target vegetation and minimize runoff.

The Air Force would protect surface waters and wetlands from the possible negative effects of herbicide application through the use of buffer zones, which are strips of vegetated land along streams, rivers, lakes, and wetlands. Buffers serve as a filtration device, separating excess nutrients, sediments, and pollutants from stormwater runoff and breaking them down or binding them within the soils. These vegetated strips help protect wetlands and water bodies from possible water contamination and fish kills caused by the introduction of herbicides. Buffers also serve as a barrier, preventing direct herbicide application by aerial spray drift to water bodies and wetlands. A general buffer zone of 300 feet is recommended around water bodies and wetlands. However, depending on the percent slope, soil erodibility quotient, and water body type and width of a specific area, a smaller buffer zone may be utilized. If using an herbicide with an aquatic use label, a buffer zone would not be needed, unless there were restrictions due to sensitive species or habitats.

Herbicide application has the potential to impact groundwater and surface water; however, the herbicides tend to degrade quickly in the environment through exposure to sunlight, water, soil components, and/or by decomposition by microbes. Additionally, implementation of the management requirements outlined in Section 2.4 would minimize the potential for non-aquatic label herbicides reaching water bodies. Thus, negative impacts to water resources are not anticipated.

Air Quality

Herbicide use would not adversely impact regional air quality. Concerns with herbicide application include drift toward nearby receptors (non-targeted plants, wildlife, or humans) during aerial application, and herbicide residues in smoke from fires. Liquid spray droplets most likely to drift are usually 100 microns in size or less. Most spray equipment is designed to produce 200 micron droplets. Numerous studies have shown that over 90 percent of spray droplets land on the target area and about 10 percent or less move off-target. The droplets that

move off-target most typically deposit within 100 feet of the target area, and deposition on surfaces downwind from aerial spray sites is typically less than 1 percent, and often less than 0.1 percent, of on-site deposition. Implementation of management requirements outlined in Section 2.4 would minimize drift occurrences.

Several studies testing smoke-suspended particulate matter, herbicide residues, and carbon monoxide in the field worker breather zone have been completed. One study found no herbicide residues in smoke samples from sites treated with labeled rates of various forestry herbicides and burned 30 to 169 days following herbicide application. Another study shows that fire intensity directly impacts the extent of herbicide combustion and volatilization, with recovery of 5 percent and less than 0.08 percent for upslope and downslope fires, respectively. Forestry-use herbicides have been detected in the air at short ranges (less than 1 kilometer) after aerial applications (spray drift), but generally not after prescribed burns in herbicide-treated stands. Forestry herbicides have not been detected in regional air mass samples or rainfall during nationwide air quality studies. Prescribed burns typically take place a year or more after herbicide application. The half-lives of these chemicals are relatively short, with the longest being 25 to 142 days. Only a few ounces or pounds of herbicide are spread over many thousand pounds of ground litter and vegetation. Therefore, the amount of viable herbicide available on-site is expected to be negligible by the time a fire would take place, and the volatilization and dispersion of herbicide to the air via smoke is not expected to have adverse impacts to regional air quality.

Biological Resources

Under the Proposed Action, there would be either no change or a decrease in the number of acres treated during forest management activities (see Table 2-2) and, therefore, there would be a net decrease in the potential quantity of herbicide used. Although vegetation control activities may kill some individual native plants, the action would be intended to enhance restoration activities, increase ecological value, and prevent the far greater loss of species diversity and ecosystem processes resulting from further uncontrolled non-native infestations. Application rate and extent of coverage, either spot or broadcast, can affect what plant species are impacted by the herbicides. Many of the species can be protected by following label application limits and specified protection measures. The timing of application and rotation of herbicides may also be important in limiting impacts to non-target native vegetation. Continuous broadcast use of one or a combination of herbicides will often select for tolerant plant species. Population shifts through repeated use of a single herbicide may also reduce plant diversity and cause nutrient changes. A variety of integrated treatments and only using a one-time application followed by spot treatments and prescribed fire would most likely avoid adverse impacts to native plant diversity. Of the available application methods, aerial application is most likely to affect non-target native plants because this method broadcasts herbicide to all plants in the treatment area. Also, drift can affect plants outside the treatment area. However, protection measures would be taken to minimize drift. Spot applications with backpack sprayers or truck-mounted sprayers focus the herbicide on the target species with limited treatment to adjacent non-target vegetation. These methods would have the least affect on native species. Because only a small portion of the overall treatment area would receive herbicide applications, the impacts to common native plants would be insignificant as they relate to species abundance, distribution, and population viability on Eglin AFB. Herbicide use may affect native plants in the short term, but in the long term would protect native plants and plant communities.

Terrestrial animals may be exposed to herbicides in several ways, including direct spray application, ingestion of or contact with plants or other items that have been sprayed, grooming, and inhalation of spray. The effects of many herbicides on mammalian, avian, and reptilian wildlife have not been studied in detail, although most herbicides have been laboratory-tested on animals such as rats, mallard ducks, bobwhite quails, mice, rabbits, and dogs. Results of these tests suggest that animals are generally tolerant of herbicide residues, and these substances do not significantly accumulate in tissues or the environment. Therefore, reproductive success and overall health should not be directly affected by herbicide application, and chronic effects are not expected. Exposure to extremely high levels of most herbicides through direct ingestion or spraying during laboratory studies often lead to death or a variety of sublethal toxic effects, including damage/irritation to the nervous system, kidneys, eyes, skin; inhibition of reproduction; and other problems. However, the doses required to produce such effects are much higher than those wildlife would encounter from application of herbicides on Eglin AFB even under worst-case scenarios. Given typical doses and areas of application, it would be nearly impossible for any animal to ingest and retaining enough of herbicide to kill or cause acute harm, even when the herbicide is applied at the maximum rate allowable. In addition, the herbicides used on Eglin appear to be rapidly excreted and do not accumulate in tissues, and therefore present a low risk for bioaccumulation and biomagnification.

Pesticides (herbicides and insecticides) are among a number of proposed causes of global amphibian decline. Although a sizable database examining effects of pesticides on amphibians exists, the vast majority of these studies focus on toxicological effects (lethality, external malformations, etc.) of single chemicals at relatively high doses (pesticide mixtures may have a greater effect than a single pesticide). The effects on amphibians include mortality, reduced disease resistance and reproductive ability, and morphological abnormalities. However, few studies have examined effects at the low concentrations that would be associated with implementation of the INRMP, and potential effects are therefore not easily defined. Because risks to amphibians are present but not predictable, Eglin would increase avoidance and minimization measures for areas that may potentially hold sensitive amphibians (see Section 2.4). Direct contact with herbicides would generally be incidental. Aerial application will not occur in riparian zones, where amphibian density is greatest. Based on short exposure times and likely concentration levels that are well below those shown to cause adverse effects to aquatic organisms, it is concluded that risk of adverse effects to fish and amphibian species in surface waters is low enough to be considered insignificant.

Socioeconomic Resources

There would be no significant negative impacts to socioeconomic resources with implementation of the Proposed Action. Recreation areas may be affected on a short term basis if herbicides are applied in or around these areas and temporary closures are required to protect public safety. If specific times of high usage, such as various hunting seasons, are considered in application planning, no negative impacts would be expected.

Environmental Justice

The primary risk to children, low-income, and minority populations would be the likelihood of short- and long-term exposure to these chemicals and whether low-income and minority populations would be affected disproportionately. In the long term, none of these chemicals are

reported to bioaccumulate due to the rapid deterioration internally, although long-term studies on humans are not known. Several herbicides potentially used on Eglin can cause moderate-to-severe eye and skin irritation or corrosion if direct contact is made. However, aerial applications of herbicides that are known to cause eye damage would be prohibited and would be applied via ground delivery system. It is not expected that children, minority, or low-income populations would be affected disproportionately. Application of the chemicals would be guided by label instructions and management practices. Aerial application would be conducted by licensed, trained and permitted pilots. With implementation of these guidelines, no impacts are expected.

Safety

No safety impacts are anticipated to result from herbicide use. Herbicide would be applied over the whole Eglin AFB Range. Application methods would include aerial and various ground application and spot-treatment techniques. The concentration at which herbicides would be applied is relatively low; however, contact with concentrate and prolonged exposure to herbicide mixtures can affect the health of applicators if proper safety procedures are not employed. These safety procedures include utilizing personal protective equipment and following handling techniques and requirements prescribed in product labels. Personnel who are certified to apply herbicides have been trained on additional safety and handling techniques and requirements. Only these certified herbicide applicators would be authorized to handle and apply herbicides on Eglin AFB. These certified applicators would also have to follow Eglin safety rules in regard to test areas, air space, and UXO.

Herbicide application would take place on test areas as well as areas open to the public for recreational use (camping, hiking, hunting, etc.). Test areas have access barriers and clear procedures for shutting down the area for testing, as well as procedures to ensure personnel safety during herbicide application, so there should be no impacts to safety in these locations. Some of the interstitial areas are also used for training and have clear barriers preventing the general public from entering the area during training exercises. In these areas, the same safety operating procedures as used in the test areas during herbicide application could be used. However, there are some areas on Eglin that do not have closable barriers, such as the area around the Florida Natural Trail. This area is regularly used by the general public for hiking. Areas that are open to the public would need to be shut down during herbicide application and for a period of time after to prevent inadvertent contact. A one-time exposure of herbicide at the concentration that would be applied is not likely to cause physical harm to humans or animals. However, it is illegal for anyone to apply herbicides directly on or through drift to another person, even accidentally (Florida Statutes, Title XXXII, Chapter 487.031). In order to close these recreational areas and ensure that a recreational user does not inadvertently come into contact with herbicide spray or wet residue, Eglin would need to post signs at entrance areas and notify the public of the time and duration of the area closure. No impacts to safety are expected, given that herbicides would be handled as described on the product labels and applied by a certified/licensed applicator, Eglin's current safety practices would be adhered to, and the management requirements described in Section 2.4 would be implemented.

Based on the preceding analyses and implementation of management requirements (Section 2.4), there would be no significant adverse impacts resulting from herbicide use. There would be a net positive effect to habitats on Eglin due to removal of non-native invasive species and restoration of native vegetation communities.

3.7.2.2 No Action Alternative

Wildfire Support

Potential environmental impacts due to wildfire support activities under the No Action Alternative would be similar to those described for the Proposed Action. Chemical materials associated with wildfire support consist of fire retardants. There would be no significant impacts to air quality, aquatic or terrestrial wildlife, water resources, soils, or vegetation resulting from use of these substances (see Section 3.7). Retardant use on Eglin is rare, with the last documented occurrence in 1998.

Forest Management and Habitat Restoration

Potential impacts due to forest management and habitat restoration activities would be associated with herbicide use. Herbicide treatment related to timber stand improvement would be less under the No Action Alternative than under the Proposed Action (1,000 acres versus 3,000 acres). The overall land area subject to timber management and restoration activities, which could potentially include herbicide use, would increase by approximately 2,200 acres (see Table 2-2). However, as discussed in Section 3.7, there would be no significant negative impacts associated with herbicide use. Herbicides would be applied according to manufacturer directions, and management requirements (Section 2.4) would decrease the likelihood of adverse effects to water and biological resources. Conducted appropriately, herbicide use would likely have an overall positive effect by promoting species diversity and natural ecosystem processes due to non-native invasive vegetation control.

3.8 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons.

Attention to cultural resources is important to Eglin AFB for its required efforts to comply with a host of federal laws, regulations, and executive orders. DoD Instruction 4715.3, *Environmental Conservation Program*, and AFI 32-7065, *Cultural Resources Management*, outline and specify procedures for Air Force cultural resource management programs. The Eglin *Integrated Cultural Resource Management Plan* specifies Eglin-specific policies and procedures regarding the treatment of cultural resources (U.S. Air Force, 2004). Under NHPA, the Air Force is required to consider the effects of its undertakings on historic properties listed or eligible for listing in the NRHP and consult with interested parties regarding potential impacts. The NRHP is the nation's formal listing of cultural resources considered worthy of preservation. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

The regulatory NHPA Section 106 compliance process consists of four primary stages. These include: initiation of the Section 106 process (36 CFR 800.3); identification of historic properties (36 CFR 800.4), which includes identifying historic properties potentially affected by undertakings; assessment of adverse effects (36 CFR 800.5), which determines whether the

undertaking will affect historic properties and if effects to those properties might be adverse; and resolution of adverse effects (36 CFR 800.6) between affected and consulting parties such as the SHPO, the Advisory Council on Historic Preservation, Indian tribes, and interested individuals. Additional stipulations are provided for in the NHPA should a failure to resolve adverse effects occur during this process (36 CFR 800.7).

Until a complete survey has been accomplished in a given area, direct physical impact to unknown cultural resources would be possible (Figure 3-17). Consultation under Section 106 of the National Historic Preservation Act would only be required if the proposed action has the potential to impact known archaeological/historic sites previously inventoried or areas not yet inventoried which the Air Force and SHPO agree have a high probability for cultural resources.

3.8.1 Affected Environment

Eglin AFB controls 464,000 acres spread across such diverse landscapes as rivers, streams, forests, and wetlands. For thousands of years Native Americans used these areas for purposes of settlement, transportation, and subsistence, as did European-Americans in more recent times.

Eglin's Cultural Resources Section has identified 2,664 archaeological sites on Eglin AFB. Although always changing as sites are evaluated or discovered, 553 sites across the reservation are listed as eligible or potentially eligible for listing on the NRHP (Cole, 2011). Research has also identified at least 28 historic cemeteries on base. While historic cemeteries are not normally eligible for the NRHP, they may be nominated as a component of a greater site complex (U.S. Air Force, 2004). Since Eglin's Cultural Resources Section has not formally evaluated any of Eglin's cemeteries for eligibility, they are currently categorically considered potentially eligible to the NRHP.

Eglin AFB oversees other historic properties, including 53 structures listed on the National Register, 133 structures considered eligible and 86 sites, considered potentially eligible to the NRHP (Cole, 2011). These include two historic districts, Eglin Field Historic District (22 structures) and Camp Pinchot Historic District (11 structures), both of which are listed on the NRHP (U.S. Air Force, 2007). Other properties listed on the NRHP within Eglin AFB include three World War II-era sites, the two JB-2 launch sites, the Operation Crossbow site, and the McKinley Climatic Lab. In addition, 33 Cold War-era structures, three Cape San Blas premilitary-era structures, 34 pre-military and homestead structures, and 24 World War II-era sites are considered significant and, therefore, eligible for the NRHP (U.S. Air Force, 2006).

3.8.2 Environmental Consequences

Any management activity that involves ground disturbing activities or fire has potential to damage cultural resources, so these activities must be coordinated through 96 CEG/CEVSH. Potential effects to cultural resources would include disturbance or destruction of historic structures and archaeological sites. Physical disturbance or the destruction of cultural resources could occur from recreation, prescribed burning, wildfire suppression, erosion control projects, and forest management activities. The analysis will focus on the potential for site disturbance or destruction given a particular activity and procedures to avoid damage to resources. Native American tribes are given the opportunity to review and comment on the INRMP.

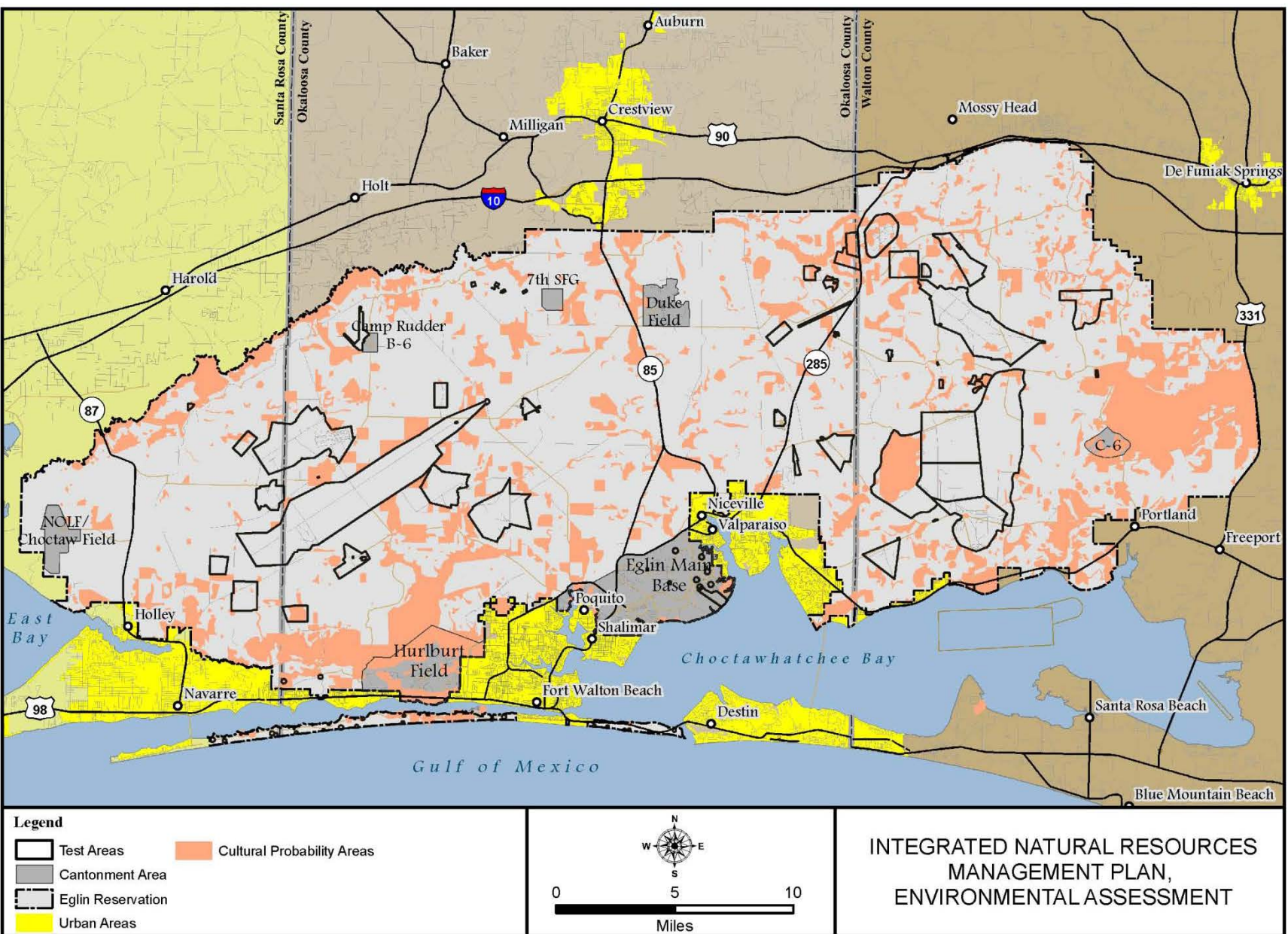


Figure 3-17. Cultural Probability Areas

3.8.2.1 Proposed Action

Prescribed Fire

96 CEG/CEVSN avoids using fire or heavy equipment in the vicinity of designated cultural resource sites. However, prescribed fire activities can adversely affect such sites in a number of ways. Should the artifacts be dragged, carried, or pushed out of their original location, they will have lost most of their research value due to the loss of proper context. In addition, some materials (wood fence posts, glass shards, etc.) may be directly affected by the fire. For that reason, 96 CEG/CEVSH has asked that these sites be protected once they have been identified. 96 CEG/CEVSN has used various techniques to protect historic sites in the past that have been very effective.

96 CEG/CEVSN and 96 CEG/CEVSH coordinate annual work plans to avoid potential impacts to cultural resources areas of constraint and, generally, prescribed fire activities do not involve the use of heavy equipment in areas close to water bodies, as this creates not only the potential for habitat damage, but also the potential for equipment to become stuck in marshy or wet areas. As a result, although the potential for adverse impacts to as yet undiscovered cultural resources do exist, it is rather small. In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted.

Wildfire Support

Wildfire suppression activities generally involve the use of heavy equipment to create firebreaks (plow lines). These activities have the potential for direct physical impacts to as yet undiscovered cultural resources. Any discovery of cultural resources during wildfire management activities is reported to 96 CEG/CEVSH. Use of firebreaks in known areas of cultural resource activity, during non-emergency fire suppression activities, should be, to the extent possible, cut to avoid cultural resource sites. Coordination with 96 CEG/CEVSH would clarify known cultural resources areas.

In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted.

Forest Management

Two fiscal years in advance of a sale, forestry personnel from 96 CEG/CEVSN provide CRM with maps of proposed timber sale tracts. Because timber cutting is considered an undertaking having the potential to affect historic properties, CEG/CEVH tasks proposed timber sale acres for inventory if the proposed tract is in a high-probability zone.

In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted.

Habitat Restoration

Any ground disturbing activity has the potential to adversely impact subsurface archaeological resources. If ground disturbing activities are planned, 96 CEG/CEV must review project information. In addition to the initial EIAP AF Form 813 review, 96 CEG/CEV reviews all digging permits (AF Form 103) and must sign off on the permit prior to commencement of the ground disturbing activity (U.S. Air Force, 2006). In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted.

Recreation Management

Per the Eglin Outdoor Recreation map and regulations, it is prohibited to search for or remove artifacts from the Eglin reservation, thus legal public recreation should not impact affect cultural resources. If ground disturbing activities are planned, 96 CEG/CEV must review project information. In addition to the initial EIAP AF Form 813 review, 96 CEG/CEV reviews all digging permits and must sign off on the permit prior to commencement of the ground disturbing activity (U.S. Air Force, 2006). In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted.

3.8.2.2 No Action Alternative**Prescribed Fire**

Prescribed fire impacts to cultural resources would be similar to those identified for the Proposed Action.

Wildfire Support

Wildfire support impacts to cultural resources would be similar to those identified for the Proposed Action.

Forest Management

Forest management impacts to cultural resources would be similar to those identified for the Proposed Action.

Habitat Restoration

Habitat restoration impacts to cultural resources would be similar to those identified for the Proposed Action.

Recreation Management

Recreation management impacts to cultural resources would be similar to those identified for the Proposed Action.

3.9 SOCIOECONOMICS

3.9.1 Affected Environment

Socioeconomic resources are defined as the basic attributes associated with human activities. The implementation of natural resource management actions outlined in the INRMP would involve an increase in personnel; an anticipated increase in revenue from additional timber management and additional sales in the number of recreational permits. Therefore, the following resources are addressed as the indicators that could potentially be impacted by the INRMP: population and economic activity associated with changes in timber sales and permit sales.

3.9.1.1 Population

The Eglin Complex is composed of three installations including Eglin Air Force Base, Hurlburt Field, and Duke Field. The Eglin Complex region of influence (ROI) is distinguishable within three counties (Okaloosa, Santa Rosa, and Walton) located in northwest Florida. In 2010, the population in the ROI totaled 387,237 persons, with the majority residing in Okaloosa County (47 percent), followed by Santa Rosa County (39 percent) and Walton County (14 percent) (U.S. Census 2010a, 2010b, 2010c).

Eglin AFB is the largest military installation under the Department of Defense and is a very active area with people visiting, working, and using the installation on a regular basis, including an estimated workforce of 17,988 persons, 46,772 retirees and dependents at Eglin AFB (U.S. Air Force 2011), 8,206 active duty staff and 10,782 active duty dependents, 1,316 civilians at Hurlburt Field, and 1,200 reservists and 300 full-time civil service personnel at Duke Field (Okaloosa EDC 2011).

3.9.1.2 Economic Activity

The socioeconomic stability of the Eglin Complex reflects the interdependencies of the three counties and Eglin. The military is the number one contributor for Okaloosa's economy with an overall economic impact of \$6 billion annually (Okaloosa EDC 2011). The communities of Cinco Bayou, Crestview, Destin, Fort Walton Beach, Mary Esther, Niceville, Shalimar, and Valparaiso have been identified as the communities most affected by base activities. In addition, the growth of Hurlburt Field and its activities have significantly affected the unincorporated areas of Navarre, Navarre Beach, and Holley.

Forest Management

The goal of forest management on Eglin AFB is to maintain and enhance the ecological integrity of Eglin forested landscapes, while also providing support to the military mission. Timber sales generated from the commercial harvest of timber are used to harvest off-site slash and sand pine plantations for conversion to native longleaf pine; and to remove sand pine that has invaded and become established in longleaf sites. Through forest management practices, managers have been able to restore, improve, and maintain the functions of the ecosystem while simultaneously improving military mission capabilities.

Within Forest Management, there are 12 full time positions. Government DoD Civil Service Forestry personnel are supervised by the Chief of Forest Management. The Forest Management Chief provides overall program direction and administrative oversight to Forest Management. The Chief and two other fulltime civil service positions are funded through the civilian pay line item within the conservation budget. The other eight fulltime civil service positions are funded by revenue generated from the sale of forest products, identified as Forestry Funds. FY09 budget and FY00-08 annual revenue is shown in Figure 3-18. Budget authorizations are ideally disbursed according to quarterly phasing requirements identified in the prepared Air Force (AF) Form 2639. Like appropriated funds, reimbursable timber sale funds are limited to single year availability for expenditure.

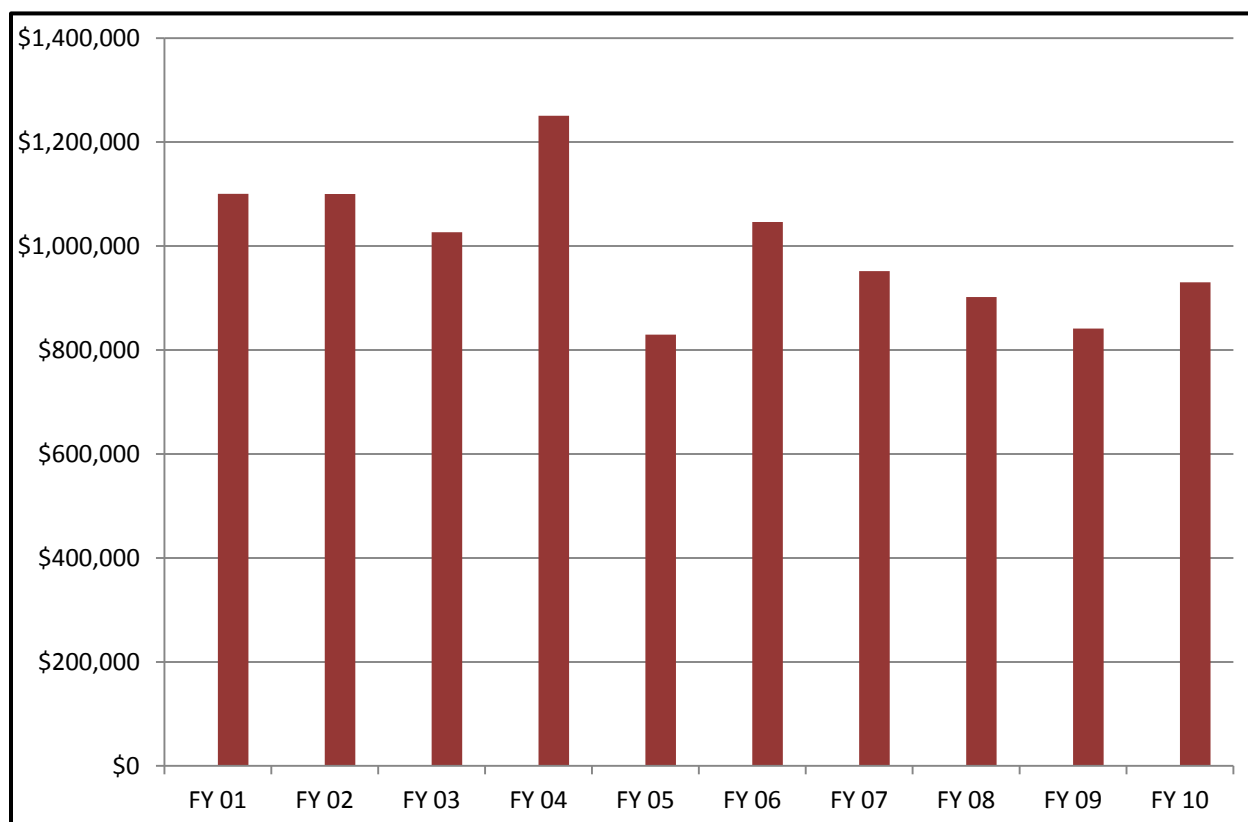


Figure 3-18. FY01 – FY10 Timber Sale Revenue

Wildland Fire Management

The Fire Management Element (96 CEG/CEVSNP) falls under the Natural Resources Section (CEVSN). Following a staffing needs analysis conducted in 2000, the Fire Management staff increased from 4 to 12 DoD civilian employees in 2004.

There are six primary funding sources managed by the wildland fire program, five of which are funded from AFMC to support Eglin's conservation activities and one that is derived from assessments to Eglin Range using customers for wildfire suppression support, commonly referred to as the Test Wing Reimbursable Billing Account (RBA). The funding for the Test Wing RBA is typically agreed upon and set the preceding fiscal year and does not fluctuate when there are exceptional suppression costs associated with severe wildfire seasons or when a below-

average (less-expensive) fire season is experienced. Unlike the other federal wildland fire management agencies, DoD does not currently have access to emergency wildfire contingency funds from Congress. During peak wildfire years such as 1998 and 2000, fire suppression expenses exceeded the fire management budget. This resulted in a request to AFMC Headquarters for supplemental funding to cover costs. Essentially all of the costs for severe wildfire seasons have been covered by other Eglin budgets.

Recreation Management

Recreational activities on Eglin AFB are also an important economic contributor for the base and local community. Recreational users must purchase a permit(s) prior to any fishing, hunting, camping, biking, hiking, or other outdoor recreational activities on Eglin AFB. Revenue from the sale of Eglin public use permits goes to maintain the income base necessary to facilitate self-sufficiency of the program. Unlike many other Eglin AFB programs, self-sufficiency is a requirement because very little financial contribution comes from the installation and/or command level. The NRS annually reviews the permit pricing schedule and makes adjustments as necessary to ensure self-sufficiency.

Various types of recreation permits are available, ranging from a \$12 general recreation permit to a \$65 sportsman permit (Table 3-25). General recreation permits are valid on a fiscal year basis (1 October through 30 September). The NRS sells approximately 6,000 general recreational use permits each year. These permits are sold to individuals who do not hunt or fish and who use the Eglin Reservation for other recreational purposes. Individuals having any current Eglin hunting or fishing permit (except for daily dove and fox, raccoon, and opossum permits) are not required to purchase this permit. Any individual 16 years of age or older entering Eglin AFB must at a minimum have in his/her possession a current Eglin Recreation Permit.

Table 3-25. Types of Recreational Public Use Permits on the Eglin Reservation

Combination Hunt & Fish Permits			
Sportsman's	\$65	Military Gold	\$20
Hunting Permits			
General Hunting	\$55	Small Game	\$10
Discounted General Hunting		Daily Dove	\$10
Senior Citizen	\$10	Trapping	\$10
Disabled	\$1	Fox, Raccoon, Opossum (3-day)	\$5
10-Day Trip	\$25	Fox, Raccoon, Opossum (Season)	\$20
Under 16 Years of Age	\$5	Special Mobility Impaired Hunt	\$25
Dog Hunting Stamp	Free	Special Youth Hunt	\$40
		Special Turkey Hunt	\$25
Fishing Permits			
General Fishing	\$20	10-Day Trip	\$6
Senior Citizen	\$6	E4 and Below	\$4
Disabled	\$1	Underage 16 Years of Age	Free
Other Recreation Permits			
General Recreation	\$12	Special Activity (per person)	\$1
Camping (per night)	\$5	Educational	Free

Source: Eglin AFB, 2012

The average annual number of permits issued over the past eight years (FY00-10) is shown in Figure 3-19, with the average annual revenue at over \$200,000. Figure 3-20 shows annual hunting, fishing, and general recreation permits issued.

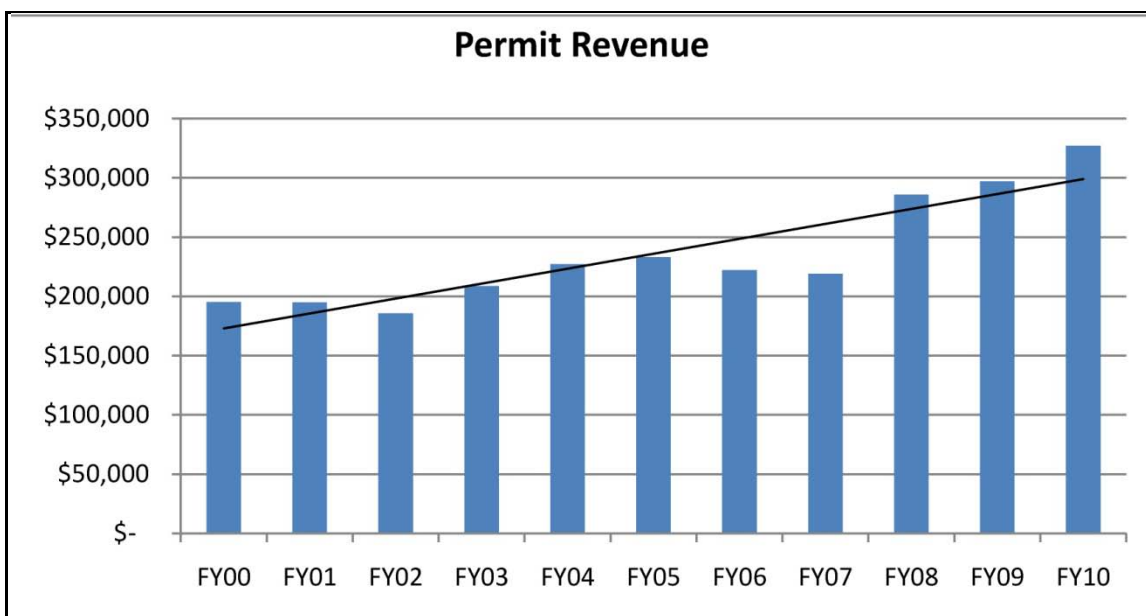


Figure 3-19. FY00-10 Annual Permit Sale Revenue

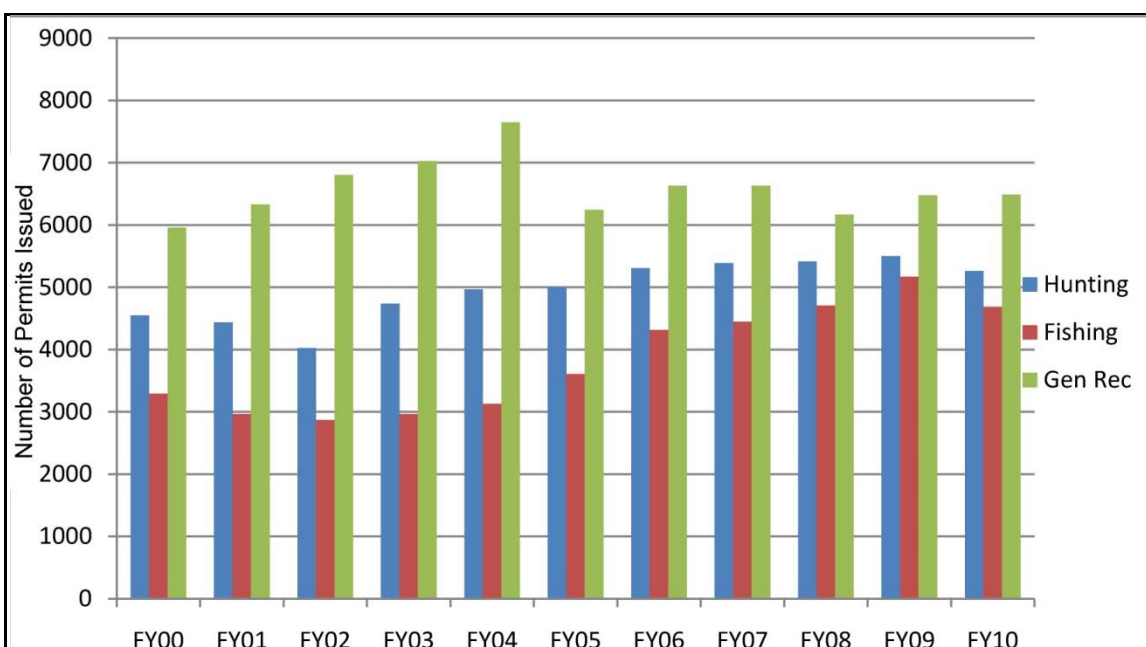


Figure 3-20. FY00-10 Total Permits Issued

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

The major impacts to socioeconomic resources from management actions outlined in the INRMP include changes to employment and potential increase in revenue-generating activity associated with timber sales and permit sales.

Population

Under the Proposed Action, management actions that increase the timber yield and recreational areas are anticipated to increase revenue, which would be used to fund up to an additional six new positions. These positions are anticipated to be filled by persons within the local community and would have no impact on population. However, if all positions were filled by persons outside the ROI, the change in population and associated socioeconomic resources would be negligible.

Forest Management

Under the Proposed Action, forestry activities would continue to support sustainable forest management practices that are both ecologically and economically sound while supporting the military mission. An increase in timber sales are anticipated from continued and additional timber management activities that would provide benefits to socioeconomic resources through increased value to the area and continued support for the military mission of the Eglin Complex, which is the major economic driver in the region. Additional revenue generated from an increase in timber sale products would ensure enough funding to support the necessary staff in order to meet the forestry management activity requirements.

In addition, under the Proposed Action, the NRS would improve coordination and involvement with the scientific, regulatory, and local community which would provide benefits to these entities as well as Eglin and NRS.

Wildland Fire Management

Under the Proposed Action, four additional fire-fighter positions would be created in order to successfully respond to the anticipated 50 percent increase in wildfire activity associated with the increase in fire-starting missions. The creation of these positions would represent a minor and negligible benefit to socioeconomic resources from an increase in total employment and spending in the community. The positions could be filled from available local labor; however, if the additional positions require personnel move into the area, there would be no anticipated impacts to socioeconomic resources because the change in population would be negligible. However, due to the increasing number of homes and businesses being constructed near Eglin's boundaries, there is an increased concern for residential areas due to the potential disruption of lives and public safety if a wildfire were to threaten any neighborhood. In the event of an emergency, additional fire-suppression support associated with the Proposed Action during a wildfire response could be a significant benefit to the community and socioeconomic resources.

Recreation Management

Based on recent trends, permit sales are anticipated to continue to increase. Additional profits generated from the sale of permits will ensure continued self-sufficiency of Eglin AFB programs and management requirements.

3.9.2.2 No Action Alternative***Forest Management***

Under the No Action Alternative, forest management would continue to support sustainable forest management practices. However, under the No Action Alternative the revenue from product sales are not anticipated to be as much as under the Proposed Action and, therefore, Eglin AFB would not have sufficient funds to support the budget for additional staffing and other programs on Eglin AFB.

Wildland Fire Management

Similar to the Proposed Action, a 50 percent increase in wildfire activity is anticipated under the No Action Alternative, because the number of fire-starting missions would increase due to the new missions assigned to Eglin AFB. Under the No Action Alternative, there would potentially be a significant adverse impact from a lack of funding and, hence, staffing to meet management requirements and the ability for NRS to respond as quickly and efficiently to the increase in wildland fire activity. The inability to meet management requirements outlined in the INRMP would violate the Sikes Act Improvement Amendments (SAIA), which requires each military installation in the United States under the jurisdiction of the Secretary of Defense to not only prepare INRMPs but implement them as well.

Recreation Management

Under the No Action Alternative, there would be no PAM, thus users would not have access to daily information on open areas. This could contribute to conflicts between recreational and military users.

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4. CUMULATIVE IMPACTS AND IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

Cumulative impacts to environmental resources result from incremental effects of proposed actions when combined with other past, present, and reasonably foreseeable future projects in the ROI. Cumulative impacts can result from individually minor but collectively substantial actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed, or anticipated over the foreseeable future, is required.

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS IN THE ROI

This section discusses the potential for cumulative impacts caused by implementation of the Proposed Action when combined with other past, present, and reasonably foreseeable actions occurring in the ROI. The ROI is defined as all Eglin AFB properties including Main Base and the whole of the Reservation.

4.1.1 Past and Present Actions

The Air Force has not identified any other past or present actions that are relevant to the current Proposed Action. Other future actions planned include implementation of the BRAC decisions made in 2005 for Eglin AFB, increased training as deployed AFSOC units return from theater, and the Eglin/Hurlburt Military Housing Privatization Initiative.

4.1.2 Reasonably Foreseeable Future Actions

Recent and upcoming BRAC actions, construction projects, and road projects (Mid-Bay Bridge Connector) are converting natural habitats to buildings, parking lots, roads, landscaped areas, and firing ranges, while increased use of interstitial areas for ground training operations is resulting in decreased access for natural resource management activities, such as prescribed fire and forest management. Wildfire frequency associated with ground training operations is also anticipated to increase in the near future.

An ROD was signed in February 2009 for the 2005 BRAC decision to establish the Joint Strike Fighter (JSF) Initial Joint Training Site (IJTS) at Eglin AFB for joint Air Force, Navy, and Marine Corps JSF training organizations to teach aviators and maintenance technicians how to properly operate and maintain this new weapons system. A Supplemental Environmental Impact Statement is currently under way to analyze options for new runways or reconfiguring existing Eglin runways to accommodate additional aircraft. As part of the 2005 BRAC decision approximately 4,000 additional military, civilian, and contractor personnel (not including family members) would relocate to Eglin AFB. Potential impacts from these programs due to changing mission and additional personnel may include noise, air quality, habitat alteration, access issues, munitions storage concerns, transportation, and utilities concerns, among others. All of these could potentially impact natural resources management at Eglin AFB. For example, construction projects may impact sensitive habitats for federally listed species, either directly through habitat

destruction, or indirectly through changes in management, such as decreased ability to conduct prescribed burns near new buildings.

The tempo and extent of ground and land-water interface training are currently increasing as the 7SFG(A) becomes fully operational on the Reservation and will continue as deployed AFSOC units return from theater. Habitat alteration is the primary natural resources concern associated with increased training due to impacts to protected species and their habitats. Increased use of the Range for ground training operations has already begun to limit access for natural resource management, which may decrease the ability to effectively conduct prescribed fires, forest restoration activities, and monitor endangered species, and may increase fragmentation of the landscape and increase wildfire frequency. Heavy ground training may induce erosion problems in areas where vegetation is trampled. Increased human presence and noise may harass certain species, such as sea turtles and RCWs, leading to issues with nesting and foraging.

Due to the BRAC decisions the Air Force needed to conduct a new housing requirements analysis in light of the changes in personnel. Thus, the Air Force intends to privatize its housing at Eglin AFB and Hurlburt Field under a statutory program to allow it to meet its military housing requirement. This is referred to as the Military Housing Privatization Initiative, or MPH. At completion of the project, a developer would own and operate 1,477 housing units on behalf of Eglin AFB and Hurlburt Field.

Due to the importance of Eglin AFB, it is anticipated that the area will undergo many future construction and renovation projects throughout the next 5 years. Similar to other construction projects, any potential future projects would most likely result in impacts to land use, air quality, noise, traffic and transportation, water resources, biological resources, local utilities, and hazardous materials. Potentially replacing older buildings and facilities with newer buildings and technologies would provide an overall benefit due to an increase in energy efficiency. Implementation of BMPs as required under construction and associated permits would minimize impacts to soils, stormwater, surface water, and air quality. Overall, the cumulative impacts from the projects described above are not anticipated to be significant.

Air Quality

Air quality would be temporarily impacted by construction activities and impacted by flight operations, munitions expenditures, and military and personal vehicle usage occurring concurrently. The emissions from construction are expected to be minimal and would have little overall effect on regional air quality. Natural resource management activities primarily impact air quality through the operation of various vehicles and equipment that combust fossil fuels. These emissions would be minimal when considered with respect to regional emissions. Further, wildfire response and the decrease in wildfires due to controlled burning practices are likely to contribute positively to regional air quality. Thus, no significant cumulative impacts to the region's air quality are expected.

Biological Resources

Localized loss of habitat, degradation of habitat, noise impacts, or direct physical impacts to species can have a cumulative impact when viewed on a regional scale if that loss or impact is compounded by other events with the same end results. Analysis of potential impacts associated

with the BRAC and MHPI has identified minimal potential for significant impacts to biological resources, which includes vegetation, wildlife, threatened and endangered species and their habitat, provided Eglin AFB implements management actions and BMPs, especially those required by Section 7 consultation with USWFS. Implementation of the Proposed Action would contribute positively to the sustained success of species of concern and other biological resources at Eglin AFB. There would not likely be any adverse cumulative impact to biological resources.

Chemical Materials

Most chemical material emissions on Eglin Reservation are related to munitions testing and training operations. Chemical materials used in natural resources management are primarily related to herbicides involved in invasive and non-native species eradication and fuels from vehicles and prescribed burning. Fire retardants may also be infrequently used. The chemical emissions from natural resources management activities are used in accordance with recommended doses and are applied with natural resource conservation in mind. These chemicals are not likely to contribute significantly to any potential cumulative impacts from combination with munitions use or construction related to BRAC, MHPI, or other activities.

Cultural Resources

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or demolition of historic structures and likewise the disturbance or removal of archaeological artifacts may incrementally impact the cultural and historic setting of Eglin AFB.

With the implementation of coordination with 96 CEG/CEVSH and best management practices, none of the management or sustainment projects discussed in the INRMP have been identified as contributing to cumulative impacts to archaeological resources. In terms of historic resources, the potential for Cold War Era military resources exists across most of Eglin AFB. If impacts to these resources are anticipated due to range activities, plans for the protection or mitigation of these resources must be developed by Eglin's Cultural Resources Section in consultation with the State Historic Preservation Officer (SHPO) and other consulting parties as appropriate.

If proper mitigation or protective measures are undertaken in consultation with the SHPO and other consulting parties within these affected areas on Eglin, no cumulative impacts are expected to this resource area.

Safety

No cumulative impacts have been identified for safety. Implementation of the natural resource management strategy in the Proposed Action would likely have a beneficial impact on range safety. New tools for communicating with the public regarding restricted access and new restrictions on firefighter access to UXO areas would particularly contribute to increased safety on Eglin Reservation.

Socioeconomics

Construction, facility improvements and infrastructure upgrades associated with past, present, and foreseeable actions would provide additional beneficial impacts to the local economy from the use of local labor and supplies. These activities would be temporary and minor, lasting only the duration of the construction and renovation activities. However, over time these activities would be anticipated to provide sustainable employment and earnings and result in beneficial cumulative impacts. Natural resource management essentially attempts to generate revenue only to fund its own programs; therefore there would be no significant contribution from the implementation of the Proposed Action to cumulative socioeconomic impacts.

Soils

Changes to soils associated with the management activities presented in this document would not substantially alter soils over time. Activities such as logging, cutting firebreaks, and other off-road activities would not occur on a large enough scale to substantially affect the soils in these areas with the implementation of best management practices.

Soil disturbance at multiple adjacent locations can have cumulative impacts. If the actions are concurrent, wind-borne eroded soil and transport through stormwater runoff can have cumulative impacts on water quality. Where the terrain slopes to greater than 12 percent, transport of soil as a result of stormwater is increased. The majority of soil coverage on Eglin AFB is primarily sandy. While sandy soils allow for rapid infiltration of water, they can also erode quite easily if situated on a steep slope. Naturally forested areas in these locations would become deforested through wildfire and earthmoving activities. It is particularly important that BMPs for the management activities be implemented in order to reduce potential cumulative impacts. These include silt fencing, hay bales, and wherever possible, seeding, so that soil/sediment runoff is slowed.

Water Resources

No cumulative impacts have been identified for water resources. Typical construction BMPs would be implemented as required for any new construction. Although some natural resources management practices such as off-road vehicle use involved in wildfire suppression could impact water resources, natural resources management would again have an overall beneficial impact on water resources on Eglin AFB, thus contributing positively to the cumulative water resource impacts in the region.

4.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that EAs include identification of any irreversible and irretrievable commitment of resources that would be involved in the implementation of the Proposed Action. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in

value of an affected resource that cannot be restored as a result of the Proposed Action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

As the objective of implementing the INRMP would be long-term sustainment of natural resources, the commitment of irreversible and irretrievable resources is not anticipated. Natural resources management has the goal of ensuring the continued health and availability of natural resources while sustaining the military mission. These efforts are not likely to significantly decrease the availability of the resources. Small amounts of nonrenewable resources (fuels, etc.) would be used; however, the Air Force does not consider these amounts to be appreciable and does not expect them to affect the availability of these resources.

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5. PLANS, PERMITS, AND MANAGEMENT ACTIONS

The following is a list of regulations, plans, permits, and management actions associated with the Proposed Action. The environmental impact analysis process for this EA identified the need for these requirements, and the proponent and interested parties involved in the Proposed Action cooperated to develop them. These requirements are, therefore, to be considered as part of the Proposed Action and would be implemented through the Proposed Action's initiation. The proponent is responsible for adherence to and coordination with the listed entities to complete the plans, permits, and management actions.

5.1 REGULATIONS, PLANS, AND PERMITS

There are a number of applicable laws and regulations that NRS must adhere to and consider prior to and during all management activities included in the Proposed Action. Table 5-1 lists the laws and regulations and displays which management activities to which each law/regulation is specifically applicable.

Table 5-1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations

Laws/Regulations	Overall Natural Resources Program:																
	Climate Change	Wetlands	Biodiversity Mgmt.	Floodplains	Coastal and Marine Resources	T&E Species Mgmt.	Fire Mgmt.	Fish & Wildlife Mgmt.	Forest Mgmt.	Outdoor Rec. Mgmt.	Land Mgmt.	Public Relations	Budgeting	Mgmt. Training and Research & Development	Planning	Fish and Wildlife Enforcement	Aquatics and H2O Mgmt.
Federal Wildland Fire Management Policy							X										
The Gonzolas Amendment, 10 U.S.C Sec. 2465							X										
AFI 32-7064 & DoDI 6055 direct wildland fire personnel to meet National Wildfire Coordinating Group Standards for training and physical fitness							X										
460 (I) Outdoor Recreation on Federal Lands 16 U.S.C. Section 460 (1)								X		X							X
E.O. 11989, Off-Road Vehicle Use policy on federal land										X							
The Marine Mammal Protection Act (MMPA), 16 U.S.C. Section 1361, et seq.						X											
Coastal Zone Management Act (CZMA) of 1972 16 U.S.C. Section 1451 et seq.						X											
Coastal Barrier Resources Act (CBRA), 16 U.S.C. Section 3501 et seq.						X											
The Estuary Protection Act, 16 U.S.C. Section 1221, et seq.						X											X
The National Marines Sanctuaries Act, 16 U.S.C. 1431 et seq.						X											
Executive Order 13089, Coral Reef Protection						X											

Table 5-1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations, Cont'd

Laws/Regulations	Overall Natural Resources Program:																
	Climate Change	Wetlands	Biodiversity Mgmt.	Floodplains	Coastal and Marine Resources	T&E Species Mgmt.	Fire Mgmt.	Fish & Wildlife Mgmt.	Forest Mgmt.	Outdoor Rec. Mgmt.	Land Mgmt.	Public Relations	Budgeting	Mgmt. Training and Research & Development	Planning	Fish and Wildlife Enforcement	Aquatics and H2O Mgmt.
“The Magnuson-Stevens Fishery Conservation & Management Act”						X											X
The Clean Air Act							X										
The Sikes Act, 16 U.S.C. 670 (a)-(f), et seq.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
The National Environmental Policy Act (NEPA)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DoDI 4715.03, Natural Resources Conservation Program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AFI 32-7064, Integrated Natural Resources Management		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
The Endangered Species Act, 16 U.S.C. Section 1531, et seq.	X					X	X	X	X		X	X	X				
E.O. 11990, Protection of Wetlands		X															X
E.O. 11988, Floodplains Management				X													
The Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. Section 661								X									
Migratory Bird Treaty Act, 16 U.S.C. Section 703, et seq.						X		X									
The Federal Noxious Weed Act, 7 U.S.C. Section 2801, et seq.											X						
Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990 / National Invasive Species Act of 1996, 16 U.S.C.											X						X

Table 5-1. Application of Eglin AFB Natural Resources Program Components and Significant Laws and Regulations, Cont'd

Laws/Regulations	Overall Natural Resources Program:																
	Climate Change	Wetlands	Biodiversity Mgmt.	Floodplains	Coastal and Marine Resources	T&E Species Mgmt.	Fire Mgmt.	Fish & Wildlife Mgmt.	Forest Mgmt.	Outdoor Rec. Mgmt.	Land Mgmt.	Public Relations	Budgeting	Mgmt. Training and Research & Development	Planning	Fish and Wildlife Enforcement	Aquatics and H2O Mgmt.
The Clean Water Act (CWA)		X		X					X								X
National Wildfire Coordinating Group (NWCG) Policies							X										
Executive Order 13148 Green the Government through Leadership and Environmental Management			X			X					X				X	X	X

The NRS must maintain certain permits for monitoring, burning, nuisance animal control, and other natural resource management activities (Table 5-2). These permits are updated annually or as required. Contractors conducting any activities on behalf of NRS (i.e., Okaloosa darter monitoring) are required to obtain the applicable permits.

Table 5-2. Required Permits for NRS Management Activities

	Permit*	Purpose	Permit Issuer
Air Force	Digging Permit (AF Form 103)	Authorizes ground disturbing activities involved in erosion control and other management activities.	96 CEG/CEV
Federal	<i>Migratory Bird Depredation Permit</i>	<i>Authorizes take, by lethal means, of certain migratory birds for the purpose of airport safety (BASH).</i>	USFWS
	Eastern Indigo Snake Permit	Permittee is authorized to capture, translocate, and release the Eastern Indigo snake in accordance with the 2008 Eastern Indigo snake programmatic Biological Assessment.	
	Manatee Skull Permit	Permittee is authorized to curate the skull for display and educational purposes.	
	Bird Marking and Salvage Permit	Authorizes the capture and marking of red-cockaded woodpeckers and burrowing owls.	
	Endangered/Threatened Species Permit: ESA Section 10(a)(1)(A)	Authorizes the capture and banding of red-cockaded woodpeckers, inspection of nest cavities, drilling of artificial cavities, installation of restrictor plates, and the training of others in these techniques.	
	Eagle Depredation Permit	Authorizes the use of non-lethal harassment activities to discourage eagle presence near the airfields	
	Eagle Nest Take Permit	Authorizes the take of an inactive eagle nest for purpose of airport safety (BASH)	
	National Pollutant Discharge Elimination System (NPDES)	As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.	USEPA
State	Wildlife Possession Permit	Authorizes keeping gopher tortoise at Jackson Guard	FWC
	Steel Trap Permit	Authorizes the use of up to 50 padded-jaw steel traps to catch/remove destructive furbearers (mainly beavers).	
	Gun and Light Permit	Authorizes the use of a gun and light at night to take depredating feral hogs, coyotes, beavers, fox, and raccoons.	
	Alligator Trapping Permit	Authorizes the capture and holding or relocation of nuisance alligators, depending on size of the alligator.	
	Marine Turtle Permit	Authorizes nesting surveys, protection of nests with screens or cages, relocation of nests, night public hatchling releases, maintenance and display of preserved specimens, and stranding and salvage activities.	
	Wildlife Possession/Institutional Permit	Authorizes the possession of the carcass or parts thereof of a black bear for educational purposes.	
	Bird Banding Permit	Authorizes the capture and banding of red-cockaded woodpeckers.	
	Inactive Osprey/Bird Nest Removal Permit	Authorizes the removal of inactive osprey and migratory bird nests in support of the BASH program.	
	Open Burning Authorization	Authorizes the utilization of prescribed burning on the Eglin Reservation (issued on a daily basis).	
	License To Sell Or Exhibit Wildlife	Authorizes the keeping and exhibition of wildlife.	

USFWS = U.S. Fish and Wildlife Service; DEA = Drug Enforcement Agency; FWC = Florida Fish and Wildlife Conservation Commission; USEPA = U. S. Environmental Protection Agency, 96 CEG/CEV = 96 Civil Engineering Group/Environmental Management Division * Contractors conducting any activities on behalf of NRS (i.e., Okaloosa darter monitoring) are required to obtain the applicable permits.

5.2 MANAGEMENT ACTIONS

5.2.1 General Requirements

- Potentially disturbing management activities (i.e., forest management) will not be conducted within active RCW clusters during the RCW nesting season.
- If an injured or dead protected species is found, NRS would contact the appropriate USFWS, NMFS, and FWC offices.
- Annual reports would be provided to the USFWS and NMFS as required per ESA Section 7 and MMPA consultations and permits.
- If a gopher tortoise, indigo snake, or black bear is spotted during management activities, vehicle operators would stop until the animal had moved to safety before resuming activity.
- 96 CEG/CEVSN and 96 CEG/CEVSH will coordinate work plans annually to avoid potential impacts to cultural resources areas
- Two fiscal years in advance of a sale, forestry personnel from 96 CEG/CEVSN will provide CRM with maps of proposed timber sale tracts.
- Should archaeological materials be inadvertently discovered during any NRS activities, all actions in the immediate vicinity would cease and efforts would be taken to protect the find from further impact.
- Brief NRS personnel and contractors on requirements resulting from the INRMP EA and any other applicable consultations including a UXO briefing.
- Brief mission and construction personnel on requirements from Section 7 consultations that are applicable to their activities, and conduct spot checks for compliance, as resources allow.

5.2.2 Prescribed Fire

For Biologically Sensitive Areas (Figure 3-11, Limited Suppression Map):

- Fire crews will be briefed on protection of biologically sensitive areas prior to and during the fire season.
- Plows will not be used off of range roads for fire line construction in Biologically Sensitive Areas unless approved by the Fire Manager.
- Construct firelines only where necessary, making use of existing barriers such as roads, water bodies, etc.
- Where possible, use alternatives to plowed lines such as harrowing, foam lines, wet lines or permanent grass.
- Do not plow lines through sensitive areas such as wetlands, marshes, prairies and savannas unless absolutely necessary. Avoid these areas or use alternative line construction methods.
- Maintain minimum plow depth at all times.

- When crossing water bodies, raise the equipment to prevent connecting the line directly to the water body.
- Do not construct firelines which act as drainage systems, particularly those that might connect or drain isolated wetlands.
- Avoid constructing plowed firelines in the Special Management Zone, particularly the Primary Zone.
- Use water bars, turnouts and/or vegetation to stabilize firelines when erosion and sedimentation might otherwise result.
- When re-vegetating firelines, use native species when possible.
- Orient firelines along the contour wherever possible to prevent erosion and gullyng.
- Do not prescribe burn for site preparation purposes within the Special Management Zone when the slope of the site is 18% or greater (Site Sensitivity Classes [SSCs] 5 and 6).

For the RCW:

- Prior to prescribed burns, prepare active RCW cavity trees and newly drilled artificial cavity trees in recruitment clusters by cutting fuels around the individual cavity trees out to a distance of approximately 5 meters using a Brown tree cutter, Positrack mower, or D.R. mower mounted behind an ATV, and then raking the clippings away from the trees with rakes.
- Post a RCW trained monitor on all prescribed burns that involve active clusters or recruitment clusters, except those within UXO restricted suppression areas
- For nighttime burns, prepare RCW cavity trees prior to fire and have trained RCW monitors present during the fire
- For prescribed burns within no and restricted suppression areas:
 - When deemed necessary, extend pre-fire preparation out further from the tree or apply fire resistant foam or water on or around the tree prior to fire being set.
 - Check all cavity trees immediately following the fire to assess damage and to determine the need for replacement cavities.
- Trained NRS staff would replace any cavity tree damaged to the point it is unsuitable for nesting or roosting within 72 hours with a box insert.
- Annually burn No Suppression areas at and around test areas A-77, A-78, A-79, B-7, and C-62.
- Use prescribed burning as the preferred method for site preparation and control of woody vegetation. Limit herbicide use to manual application according to BMPs only when fire cannot be used.

For the flatwoods salamander:

- Avoid tying fire lines into known flatwoods salamander breeding ponds and other seasonal ponds, and avoid plowing around these ponds.

- During prescribed burning or fire fighting operations, avoid using foam or water from tanks containing foam residue in or around seasonal ponds.
- For necessary firebreaks along the urban interface within wetland areas, NRS will follow requirements from the *Gyrotrack Section 7 Consultation* (U.S. Air Force, 2003), including:
 - Use a low ground pressure Positrack tracked vehicle for mowing
 - Conduct work during dry periods

5.2.3 Wildfire Support

For Biologically Sensitive Areas (Figure 3-11, Limited Suppression Map):

- Fire crews will be briefed on protection of biologically sensitive areas prior to and during the fire season.
- Plows will not be used off of range roads for fire suppression except in extreme conditions and with approval from the Fire Manager. Skim existing roads and trails or burn out areas to contain fires first.
- If necessary to plow near Okaloosa darter streams, Gulf sturgeon critical habitat, or freshwater mussel habitat during emergency wildfire situations, submit an incident letter to the USFWS.
- Restore any hydrological modifications or erosion sources created by plow lines created during emergency situations in wetlands.

For RCWs:

- For wildfires within no and restricted suppression areas, check all cavity trees immediately following the fire to assess damage and to determine the need for replacement cavities.
- Replace any cavity tree damaged to the point it is unsuitable for nesting or roosting within 72 hours with a box insert.
- Hire four additional firefighter positions.

For flatwoods salamanders:

- To minimize the potential for wildfires, NRS will maintain a three year burn rotation in the East Bay Flatwoods area.
- Brief fire crews on protection of flatwoods salamander habitat prior to and during the fire season.
- For fire suppression activities within known and potential salamander habitat:

- Plows will not be used off of range roads for fire suppression except in extreme conditions.
- Fire crews will avoid plowing for suppression unless absolutely necessary; block and burn methods are preferable.
- If fire plows or foam are used during extreme conditions, submit an incident letter to the USFWS, and complete restoration activities in cooperation with the USFWS

5.2.4 Forest Management

Follow the *Silvicultural BMPs for Florida* (FL Department of Agriculture, 2011) during forest management activities:

Skid Trails

- Locate skid trails along the contour whenever practical to promote re-vegetation and reduce soil erosion. If skidding must be done up or down the slope, the operator should skid uphill and avoid long, continuous skid trails.
- After skidding activities are complete, stabilize skid trails where necessary by installing water bars or similar structures at recommended intervals - seeding and fertilizing skid trails will accelerate stabilization on erodible soils and/or steep slopes.
- When skidding in muck or peat (organic) soils such as in swamps, bogs or similar wetlands, concentrate skidding to as few trails as possible - this will confine soil compaction to small areas.
- When skidding on mineral soils, such as in uplands, skidding should be dispersed so that soil compaction is minimal even in individual trails.
- Keep main skid trails out of all Special Management Zones except to approach a designated crossing.
- Keep loading decks or landings out of all Special Management Zones. In addition, keep all log bunching points out of the Primary Zone of the SMZ.

Slash Disposal

- Logging slash, such as tops and limbs, which are incidental to timber harvesting activities, may be left in place, as long as such material is not left in a water body.
- Remove logging slash from all water bodies including both intermittent and perennial streams, lakes and sinkholes.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes, sinkholes or similar water resource features.

Site Preparation and Planting

- Plan site preparation and planting procedures prior to timber harvesting activities.

- Select only the site preparation techniques that are necessary to establish seedlings and minimize vegetative competition - do not needlessly disturb the ground surface or expose the topsoil.
- Do not conduct mechanical site preparation within any part of the Special Management Zone.
- Do not conduct intensive mechanical site preparation such as bedding, raking and windrowing in wetlands.
- When chopping, pull chopper perpendicular to a water body to orient soil indentations along the contour (not necessary if chopping is followed by bedding or if the water body is separated from the chopped area by windrows or a similar barrier to overland flow).
- Arrange windrows and soil beds parallel to a water body or wetland in order to provide a barrier to overland flow prevent concentration of runoff and reduce erosion.
- When using a blade to shear, push, or pile debris, keep the blade above the soil surface. This will minimize erosion and facilitate rapid site recovery and tree growth.
- Do not pile or push logging slash into cypress ponds or strands, swamps, marshes, grassy ponds, or water bodies such as streams, lakes or similar water resource features.
- Do not conduct site preparation burning within the SMZ where slopes are 18% or greater.
- Commercial contractors retained to harvest timber on the Eglin Reservation are monitored by NRS for site prep/tree removal regulatory and best management compliance.
- Stumping operations are allowed only in areas of proposed roads, facilities, and planned construction.
- After forest operations, unnecessary forest roads are closed.
- In pine plantations, single drum chopping is used whenever possible (instead of bedding and root-raking).
- Forestry activities within RCW foraging habitat will be conducted in accordance with the most current RCW Recovery Plan tree density requirements.
- Logging operations avoid active and inactive gopher tortoise burrows when using heavy equipment.
- Follow requirements from the *Eastern Indigo Snake Programmatic Biological Opinion (BO)* (USFWS, 2009), including provide educational materials on the indigo snake to contractors.
- NRS will apply the USFWS *Recommended Timber Management Practices for the Flatwoods Salamander* (Federal Register, 1999) (Table 5-3).

Table 5-3. Recommended Timber Management Practices for the Flatwoods Salamander

Primary Zone	Secondary Zone
538 ft from pond edge	538 to 1476 ft from pond edge
Selective harvest only	Mix of clear-cutting and selective harvest; Clear cut up to 25 percent at any given time, maintain 75 percent of flatwoods habitat
Harvest only during dry periods	
Harvest at a minimum of 10-yr intervals	
Maintain basal area at 45-50 ft ² per acre	
Primary and secondary zones should not be separated by cleared or non-pine flatwoods habitat	
Locate skid trails so that wetland hydrology is not altered	
Locate log landings outside the primary and secondary zones	
Do not conduct intensive mechanical site preparation (root-raking, discing, stumping, bedding)	

Herbicide Application

Follow requirements in the *Long-term Vegetation Control (LVC) EA* and *Hexazinone Application on Interstitial Areas* consultation (U.S. Air Force, 2001; U.S. Air Force, 2007), including:

- All herbicide applicators used will be certified Florida herbicide applicators. New contracts will require herbicide applicators to be certified in the Florida Natural Areas Category.
- Herbicide labels and instructions would be adhered to during handling, mixing, and application of all herbicides.
- Sensitive habitat locations would be digitized using GPS/GIS. The files would be provided to herbicide applicators to avoid the areas, unless application in such areas is specifically approved by the NRS.
- Coordination with an Eglin NRS endangered species biologist would be required prior to applying herbicides in sensitive areas.
- All contractors and their staff will be briefed on any potential endangered species concerns before conducting herbicide application activities in endangered species habitat.
- Herbicide applications for all non-aquatic labeled herbicides would not occur within 1,500 feet of confirmed and potential flatwoods salamander ponds, or within 300 feet of Okaloosa darter streams, Gulf sturgeon critical habitat, FL bog frog streams, or gopher frog ponds.
- Restrict aerial application of non-aquatic label pesticides near aquatic sensitive habitats.
- Time the application of herbicides to avoid upcoming rain events.
- During the RCW nesting season (April to July), any treatments occurring within the boundaries of active RCW clusters would be hand crew application methods only.
- Site-specific natural or man-made drainage features, road corridors, or slopes with insufficient ground cover are not to be treated.

5.2.5 Habitat Restoration

Invasive Non-Native Plant Species Management

- Follow all Herbicide Use requirements from the Forest Management section above during INPS management activities. Additionally, herbicide applicators must be trained in the proper identification of invasive and native species.
- Herbicide applicators will be trained in the proper identification of invasive and native species.

Erosion Control and Fish Passage Restoration

- Follow the *Silvicultural BMPs for Florida* (FL Department of Agriculture, 2011) during habitat restoration activities.
- Temporary silt fencing or hay bales would be installed during restoration activities
- Native grasses and woody vegetation would be planted at the end of restoration activities, and maintained until the site is stabilized.

5.2.6 Nuisance and Non-native Animal Management and BASH

- All feral hogs that are taken would be euthanized.
- Feral cats captured on SRI are live trapped and delivered to PAWS.
- Public outreach and education is conducted to improve understanding and tolerance regarding wildlife encounters. For example, Eglin base housing residents are provided with nuisance animal (black bear, snake and alligator) information.

5.2.7 Protected Species Management and Monitoring

All Protected Species

- Only individuals who have been authorized by a section 10(a)(1)(A) permit issued by the USFWS (and when applicable, authorized by the FWC) for such activities, would be permitted to come in contact with or relocate a sea turtle, indigo snake, or other federally listed species.
- Brief construction and mission personnel regarding requirements from ESA and MMPA consultations (i.e., stop if sea turtle, tortoise, indigo snake, etc. are spotted).

Indigo Snake

- Follow requirements from the *Eastern Indigo Snake Programmatic Biological Opinion (BO)* (USFWS, 2009). If it is necessary to relocate an indigo snake, then use the Indigo Snake Habitat Suitability and Relocation Models to determine the most appropriate location to release the snake. Snakes would only be held in captivity long enough to transport them to a release site, and only one snake to a container during transport.
- Distribute indigo snake signs to construction projects.

RCW

- During translocation associated activities, follow protocol as described in the revised RCW Recovery Plan and the Terms and Conditions in the Biological Opinion.
- For active clusters, mark 200 ft RCW buffer for training restrictions with GPS coordinates or existing GIS coverage, and update as changes occur within the clusters. Provide GPS data to training groups.

Sea Turtle Surveys

- Eglin AFB will implement their sea turtle nesting survey program in accordance with FWC permit requirements. Nest surveys would only be conducted by personnel with experience and training in nest survey procedures. Surveyors must be included on a valid State of Florida FWC permit.
- Nests deposited on Okaloosa/Santa Rosa Island must be marked and left in situ unless relocation is advised and in compliance with USFWS and FWC guidelines.

Sea Turtle Requirements for Management Activities (May 1 to October 31)

- Use only sea turtle compatible hand-held lights during sea turtle season.
- Personnel must operate vehicles at speeds less than 10 miles per hour (except in emergency situations).
- Vehicles must not have tire pressures greater than 10 psi.
- Removal of all ruts seaward of nests expected to hatch within 10 days must be completed before sunset each day or until 3 days after first signs of hatchling emergence, or the nest has been washed out or destroyed whichever is earlier.
- No daytime (sunrise to sunset) beach driving by Eglin personnel shall occur on the Gulf beachfront before completion of daily sea turtle nest survey and protection measures.
- Do not drive vehicles on or across the dunes and vehicles must be driven seaward of the wrack or debris line (previous high tide) or just above it during high tide conditions.
- Headlights must be covered with the appropriate sea turtle filter material; if not feasible, vehicle headlights should be used at night only when the vehicle is moving.
- Personnel in vehicles on the beach must stop the vehicle, shut off the engine, switch from headlights to parking lights if at night (if applicable), and remain stationary (inside or on a vehicle if possible) until the adult female turtle completes nesting and returns to the sea or a hatchling(s) emerges from the nest and enters the sea.
- Any dune restoration must be designed and conducted to minimize impacts to sea turtles in accordance with Florida Department of Environmental Protection guidelines.
- Eglin must ensure Gulf County maintains compliance of the real-estate lease which outlines the restrictions for beach driving on Cape San Blas.

Flatwoods Salamander Hardwood Control

- For hardwood control in flatwoods salamander ponds, apply herbicide with a sprayer to stumps using a U.S. EPA and FL Dept of Agriculture and Consumer Services approved herbicide for aquatic environments (e.g., Garlon 3A) immediately after cutting the plants. Apply in accordance with label instructions.
- Any re-fueling or lubricating of equipment shall be done at least 150 ft from the edge of the water in the pond.
- Cut plants will either be scattered in the uplands adjacent to the wetland in piles up to five ft above ground level, or scattered throughout the wetland, avoiding piles.
- All work must be completed outside of breeding season (October to December).

5.2.8 Recreation Management

At SRI:

- Requirements in the Sea Turtle Requirements for Management Activities section above also apply to Eglin Range Patrol activities.
- Post the exclusion areas and official beach access points on the public use portion of SRI, including information on the hours that beaches are closed to activities (sunset to sunrise). Post *Cladonia* areas and piping plover critical habitat.
- Work with Okaloosa County Sheriff's Office to ensure patrols of the public access portion of Eglin SRI property avoid sensitive areas and that they follow appropriate methods for driving on the beach.

At CSB:

- Requirements in the Sea Turtle Requirements for Management Activities section above also apply to Eglin Range Patrol activities.
- Eglin must ensure Gulf County maintains compliance of the real-estate lease which outlines the restrictions for beach driving on Cape San Blas, including:
 - Prohibiting driving on Air Force beaches from sunset until 9 a.m. from 1 May to 1 November and enforcing such prohibition.
 - Posting beach signs and removing ruts caused by beach driving.
- Post the exclusion areas and official beach access points at CSB, including information on the hours that beaches are closed to activities (sunset to sunrise).
- Maintain gates to restrict vehicle access to Eglin beaches from sun-down to sun-up during sea turtle season (May 1 through October 31), and institute a rut removal program.

On Eglin Mainland:

- Gates and cables will be used to restrict access to prevent unauthorized vehicles from using the fuel break along the urban interface south of the East Bay flatwoods as a road. The boundary will be monitored for unauthorized vehicle use and illegal dumping.

- As problem areas for off-road driving are identified, the NRS will implement restricted access controls sensitive habitats.
- During the Youth Fishing Rodeo, NRS personnel would be present at the rodeo to keep participants out of sensitive areas.

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References

7. REFERENCES

- Cole, G., 2011. Personal communication via email from George Cole (96 CEG/CEV/CEVSH) to Jason Koralewski (SAIC) regarding National Register of Historic Places eligible cultural resources sites on Eglin AFB.
- Engeman, Richard M., Amanda Stevens, John Allen, John Dunlap, Marty Daniel, Dennis Teague, and Bernice Constanin. 2007. Feral swine management for conservation of an imperiled wetland habitat: Florida's vanishing seepage slope. *Biological Conservation* 134: 440–446.
- Federal Register, 1999. 64 FR 15691-15704, 50CFR17, Endangered and Threatened Wildlife and Plants; Final Rule to List the Flatwoods Salamander as a Threatened Species. April 1, 1999.
- Federal Register, 2011. Fish and Wildlife Service Reclassification of the Okaloosa Darter from Endangered to Threatened and Special Rule. Vol. 76, No. 63 / Friday, April 1, 2011
- Florida Department of Agriculture and Consumer Services (FDOACS), 2011. Best Management Practices for Silviculture in Florida. Division of Forestry.
- Florida Department of Environmental Protection (FDEP), 2008. *Florida Stormwater, Erosion, and Sedimentation Control Inspector's Manual*. Technical Report. Retrieved from <http://www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf> on 23 December 2011.
- Florida Department of Environmental Protection (FDEP), 2010. Choctawhatchee-St. Andrews Group 3 Basin – Northwest District – Cycle 2 Verified List. Hydrologic Units: Choctawhatchee River, Choctawhatchee Bay, Pea River, and St. Andrews Bay. Retrieved from <http://www.dep.state.fl.us/Water/watersheds/assessment/docs/303d/group3/adopted/cycle2/choctaw-verified-c2.pdf>, on 28 January 2010.
- Florida Department of Environmental Protection, 2011. Florida Coastal Management Program Guide. 3900 Commonwealth Blvd, Tallahassee, FL 32399. www.dep.state.fl.us/cmp. March 2011.
- Florida Division of Forestry, 2011. Prescribed Fire. Accessed from http://www.fl-dof.com/wildfire/rx_index.html on 10 October, 2011.
- Florida Game and Fresh Water Fish Commission, 1997. Personal communication with SAIC. Bureau of Nongame Wildlife – Endangered Species. Tallahassee, Florida. April 1997.
- Hiers, J. K., S. C. Laine, J. J. Bachant, J. H. Furman, W. W. Greene, and V. Compton, 2003. Simple spatial modeling tool for prioritizing prescribed burning activities at the landscape scale. *Conservation Biology* 17:1571-1578.
- Intergovernmental Panel on Climate Change (IPCC), 2007. IPCC Fourth Assessment: Climate Change 2007. A Report of the Intergovernmental Panel on Climate Change, as cited in Air Force Materiel Command (AFMC), 2009. Air Force Materiel Command Greenhouse Gas Inventory Guidance (Interim). Prepared by Air Force Center for Engineering and the Environment (AFCEE). February 2009.
- Mitsch, W. J., and J. G. Gosselink, 2000. *Wetlands*, 3rd Edition. John Wiley & Sons: New York.
- National Wildfire Coordination Group (NWCG), 2011. *Wildland Fire Qualification System Guide* (310-1). Available at: <http://www.nwcg.gov/pms/docs/docs.htm>. November 2011.
- O'Brien, Robert J. and Wade, Mark D. 2003. United States Air Force IERA Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations. Revised December 2003.
- Okaloosa Economic Development Council (EDC), 2011. "Military Installations." Available online at: <http://www.florida-edc.org/Military.htm>. Accessed on July 5, 2011.

References

- Ottmar, R. D., 2001. Pacific Wildland Fire Sciences Laboratory USDA Forest Service Pacific Northwest Research Station, Page 100 in 2001 Smoke Management Guide Book. <http://www.fs.fed.us/pnw/fera>.
- Overing, J. D., H. H. Weeks, J. P. Wilson, Jr., J. Sullivan, and R. D. Ford, 1995. Soil Survey of Okaloosa County, Florida. USDA, Natural Resources, Soil Conservation Service.
- Strait, Randy, Maureen Mullen, Bill Dougherty, Andy Bollman, Rachel Anderson, Holly Lindquist, Luana Williams, Manish Salhotra, and Jackson Schreiber, Final Florida GHG Inventory and Reference Case Projections 1990-2025, Center for Climate Strategies, October 2008
- U.S. Air Force, 2001. Biological Assessment to Determine Potential Impacts to Federally Listed Species Resulting from the Application of the Forest Herbicide Hexazinone on Eglin's Interstitial Forest Lands. Biological Assessment. March 2001.
- U.S. Air Force, 2002. Biological Assessment for Integrated Natural Resources Management Plan (INRMP) 2002-2006. Eglin AFB, Florida.
- U.S. Air Force, 2003a. *Environmental Baseline Study Resource Appendices (EBSRA), Volume I – Eglin Land Test and Training Range*. Eglin AFB, Florida. 22 December 2003.
- U.S. Air Force, 2003b. Gyrotrack Section 7 consultation for fire break along urban interface. 16 May, 2003.
- U.S. Air Force, 2003c. *Environmental Restoration Program Management Action Plan*. Headquarters, AAC, Eglin AFB. July 2003.
- U.S. Air Force, 2004. Eglin AFB Integrated Cultural Resources Management Plan, Eglin AFB, FL. September 2004.
- U.S. Air Force, 2005. *Spill Prevention, Control, and Countermeasures (SPCC) Plan for Eglin AFB*.
- U.S. Air Force, 2006. Threatened and Endangered Species Component Plan of the 2007–2012 INRMP for Eglin AFB, FL.
- U.S. Air Force, 2007. U.S. Air Force Final Environmental Assessment for Long-Term Vegetation Control on Eglin AFB. October 2007.
- U.S. Air Force, 2008. *Proposed Implementation of the Base Realignment and Closure (BRAC) 2005 Decisions and Related Actions at Eglin AFB, Florida, Final Environmental Impact Statement*. Prepared by Science Applications International Corporation. October 2008.
- U.S. Air Force, 2009. Eglin AFB Integrated Natural Resources Management Plan, 2008 Annual Update. Prepared by Science Applications International Corporation. February 2009.
- U.S. Air Force, 2011a. Eglin Air Force Base Draft Forest Management Component Plan of the INRMP, Eglin AFB, July 2011.
- U.S. Air Force, 2011b. Fiscal Year 2010 Eglin Air Force Base Final Greenhouse Gas Inventory Report, Eglin Air Force Base, July 2011.
- U.S. Air Force, 2011c. Eglin Air Force Base Draft Wildland Fire Management Component Plan of the INRMP, Eglin AFB, July 2011.
- U.S. Air Force, 2011d. Eglin Air Force Base Comprehensive Range Plan, Eglin AFB, June 2011.
- U.S. Air Force, 2012. Eglin AFB Integrated Natural Resources Management Plan. Prepared by Science Applications International Corporation. February 2012.

References

- U.S. Census Bureau, 2010a. “Okaloosa County, Florida.” State & County QuickFacts. Available online at: <http://quickfacts.census.gov/qfd/states/12/12091.html>. Accessed on July 5, 2011.
- U.S. Census Bureau, 2010b. “Santa Rosa County, Florida.” State & County QuickFacts. Available online at: <http://quickfacts.census.gov/qfd/states/12/12113.html>. Accessed on July 5, 2011.
- U.S. Census Bureau, 2010c. “Walton County, Florida.” State & County QuickFacts. Available online at: <http://quickfacts.census.gov/qfd/states/12/12131.html>. Accessed on July 5, 2011.
- U.S. Environmental Protection Agency (USEPA), 1996. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources; AP-42, 5th Edition. U.S. Environmental Protection Agency, Office of Air Planning and Standards, Research Triangle Park, NC. Chapter 13 Wildfires and Prescribed Burning. October 1996.
- U.S. Environmental Protection Agency (USEPA), 2002. USEPA 2002 National Emissions Inventory (NEI) Microsoft Access database. Retrieved at <http://www.epa.gov/ttn/chief/net/2002inventory.html#inventorydata> in May 2006.
- U.S. Environmental Protection Agency (USEPA), 2009. Federal Register, 40 Code of Federal Regulations (CFR) Parts 86, 87, 89, et al., Mandatory Reporting of Greenhouse Gases, Final Rule, October 30, 2009, EPA-HQ-OAR-2008-0508-2278.
- U.S. Environmental Protection Agency (USEPA), 2011a. National Ambient Air Quality Standards (NAAQS). Accessed online at <http://www.epa.gov/air/criteria.html>. 10 October 2011.
- U.S. Environmental Protection Agency (USEPA), 2011b. Agricultural Burning. Accessed online at <http://www.epa.gov/agriculture/tburn.html#Prescribed>, 10 October 2011.
- U.S. Environmental Protection Agency (USEPA), 2011c. Carbon Sequestration in Agriculture and Forestry. Accessed online at <http://www.epa.gov/sequestration/faq.html>, 4 October 2011.
- U.S. Fish and Wildlife Service (USFWS), 2002. Biological Opinion for Integrated Natural Resources Management Plan (INRMP) 2002-2006. Eglin AFB, Florida.
- U.S. Fish and Wildlife Service (USFWS), 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*), second revision. U.S. Fish and Wildlife Service, Atlanta, GA, 296 pp.
- U.S. Fish and Wildlife Service (USFWS), 2009. Eastern Indigo Snake Programmatic Biological Opinion (BO). 18 February 2009.
- U.S. Forest Service, 2011a. Helicopter Services, Accessed from http://www.fs.fed.us/fire/contracting/helicopters_cwn/flt_chrt_awarded_2008-2011.pdf on 4 October, 2011.
- U.S. Forest Service, 2011b. Climate Change Considerations in Project Level NEPA Analysis, January 13, 2009. Accessed from http://www.fs.fed.us/emc/nepa/climate_change/includes/cc_nepa_guidance.pdf on 10 October, 2010.
- U.S. Geological Survey (USGS), 2011. <http://ga.water.usgs.gov/edu/dictionary.html>. Accessed 15 October 2011.
- UMRSHNC (Upper Mississippi River Sub-basin Hypoxia Nutrient Committee). 2008. Final Report: Gulf Hypoxia and Local Water Quality Concerns Workshop. St. Joseph, Michigan: ASABE. Copyright 2008 by the American Society of Agricultural and Biological Engineers Accessed from: http://www.umrshnc.org/index.php?option=com_docman&task=doc_view&gid=27&Itemid=74 on 4 October 2011.

References

- Weeks, H. H., A. G. Hyde, A. Roberts, D. Lewis, and C. R. Peters, 1980. Soil Survey of Santa Rosa County, Florida. USDA, Natural Resources, Soil Conservation Service.
- Wiedinmyer, Christine and Matthew D. Hurteau. Prescribed Fire as a means of reducing forest carbon emissions in the Western United States, *Environ.Sci.Technol.*, 2010, 44, pp. 1926-1932
- Williams, B.W., E.B. Moser, J.K. Hiers, K. Gault, and D.K. Thurber, 2004. Protecting Red-Cockaded Woodpecker Cavity Trees Predisposed to Fire-Induced Mortality. *The Journal of Wildlife Management* 70(3).

APPENDIX A

AIR QUALITY

A. CRITERIA POLLUTANTS

A.1 AIR QUALITY PROGRAM OVERVIEW

In order to protect public health and welfare, the U.S. Environmental Protection Agency (USEPA) has developed numerical concentration based standards or National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants (based on health-related criteria) under the provisions of the Clean Air Act (CAA) Amendments of 1970. There are two kinds of NAAQS: primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (Government Printing Office, no date).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Division of Air Resource Management within the Florida Department of Environmental Protection (FDEP) administers the state’s air pollution control program under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act.

Florida has adopted the NAAQS as written in the federal regulations (40 Code of Federal Regulations [CFR] Part 51), except Florida has established a more conservative standard for sulfur dioxide (SO₂). USEPA has set the annual and 24 hour standards for SO₂ at 0.03 parts per million (ppm) (80 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) and 0.14 ppm (365 $\mu\text{g}/\text{m}^3$), respectively. Florida has adopted the more stringent annual and 24 hour standards of 0.02 ppm (60 $\mu\text{g}/\text{m}^3$) and 0.1 ppm (260 $\mu\text{g}/\text{m}^3$), respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1300 $\mu\text{g}/\text{m}^3$). Federal and State of Florida ambient air quality standards are presented in Table A-1 (Florida Administrative Code [FAC]).

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than the NAAQS (attainment), worse than the NAAQS (nonattainment), and unclassifiable. Those areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are “unclassifiable” and are treated as attainment until proven otherwise. Attainment areas can be further classified as “maintenance” areas. Maintenance areas are those areas previously classified as nonattainment that have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state of Florida are in compliance with the NAAQS.

Table A-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Federal Primary NAAQS(8)	Federal Secondary NAAQS(8)	Florida Standards
Carbon Monoxide (CO)	8-hour(1)	9 ppm (10 mg/m ³)	No standard	9 ppm (10 µg/m ³)
	1-hour(1)	35 ppm (40 mg/m ³)	No standard	35 ppm (40 µg/m ³)
Lead (Pb)	Quarterly	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)
Particulate Matter ≤10 Micrometers (PM ₁₀)	24-hour(2)	150 µg/m ³	150 µg/m ³	50 µg/m ³
Particulate Matter <2.5 Micrometers (PM _{2.5})	Annual(3)	15 µg/m ³	15 µg/m ³	150 µg/m ³
	24-hour(4)	35 µg/m ³	35 µg/m ³	15 µg/m ³
Ozone (O ₃)	1-hour(7)	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	0.12 ppm (65 µg/m ³)
	8-hour(5)	0.075 ppm (2008 std)		(235 µg/m ³)
	8-hour(6)	0.08 ppm (1997 std) (157 µg/m ³)	0.08 ppm (157 µg/m ³)	
Sulfur Dioxide (SO ₂)	Annual	0.03 ppm (80 µg/m ³)	No standard	0.02 ppm (60 µg/m ³)
	24-hour(1)	0.14 ppm (365 µg/m ³)	No standard	0.10 ppm (260 µg/m ³)
	1-hour(1)	75 ppb	0.50 ppm (1300 µg/m ³)	0.50 ppm (1300 µg/m ³)

Source: USEPA, 2011a (Federal Standards); FAC 62-204.240, 2006 (Florida Standards)

ppm = parts per million; mg/m³ = milligrams per cubic meter; NAAQS = National Ambient Air Quality Standards; µg/m³ = micrograms per cubic meter

(1) Not to be exceeded more than once per year

(2) Not to be exceeded more than once per year on average over 3 years

(3) To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard, and the implementation rules for that standard, will remain in place for implementation purposes as the USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

Each state is required to develop a state implementation plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state, and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

Florida has a statewide air quality-monitoring network that is operated by the state FDEP State Air Monitoring Reports (FDEP, 1996). Ambient air quality data from these monitors are used to assess the regions' air quality in comparison to the NAAQS. The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards; also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality exceedances of the NAAQS as well as pollutant trends.

The FDEP Northwest District operates monitors in several northwest counties, including Bay, Escambia, and Santa Rosa Counties. Over the years of record there have been exceedances (pollutant concentration greater than the numerical standard) of the NAAQS. However, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard (FDEP State Air Monitoring Reports). Currently, all areas in the state of Florida are attainment for all criteria pollutants.

Project Calculations: Air Emissions of Criteria Pollutants

Calculations are performed to provide emissions of criteria pollutants for use in comparing the 2008 INRMP actions to the proposed 2012 INRMP actions. Air Quality emissions were calculated for activities associated with prescribed burning, wildfires, and forest management. Impacts from fire emissions, equipment use, timber management, and habitat restoration are analyzed for the duration of the proposed action and compared to the impacts from the no action alternative.

Analytical Methods, Calculations and Assumptions

Emissions were calculated using data provided by Eglin Natural Resources and emission factors. Emission factors for equipment and vehicles were obtained from the United State Air Force IERA, Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (data is taken from the USEPA non-road and on-road mobile source equipment sources) (O'brien et al 2003). Emissions were then compared to the National Ambient Air Quality Standards (NAAQS).

Prescribed Burning and Wildfires—Fire Emissions

Emissions from fire of carbon monoxide (CO), NO_x (nitrous oxides), particulate matter (PM), and volatile organic compounds (VOCs) were calculated using emission factors in Table A-2.

Table A-2. Fire Emission Factors for Criteria Pollutants

Pollutant	Emission Factors for Prescribed Burning (lbs/acre)	Emission Factors for Wildfires (lbs/acre)
CO	809	1,256
NO _x	18	36
PM	119	153
VOC	16	216

Source: U.S. Air Force, 2011 [CY2010 AEI]

Where,

E_{POL} = Emissions of a particular pollutant (tons/year)

EF = Emission Factor (lb/acre)

2000 = Conversion from pounds to tons

Prescribed Burning and Wildfires--Equipment Use**Table A-3. Fire Support Equipment Emission Factors for Criteria Pollutants**

Emissions by Equipment	CO	NO _x	PM	SO _x	VOC	Units
Tractor	1	3.3	0.72	1.19	0.2	g/hp-hr
ATVs ¹	975	9	1.15	0.18	100	g/hr
Fire Engines	1.9	1.5	7.8	0.157	1	g/mile
Tractor Transport Truck	1.9	1.5	7.8	0.157	1	g/mile
Pickup Truck	38.6	2.5	13.43	0.098	3.4	g/mile
Helicopter²						
Ground Idle	29.78	3.05			10.42	lb/1000lbfuel
Flight Idle	30.71	3.08			8.65	lb/1000lbfuel
Cruise	2.64	4.9			0.18	lb/1000lbfuel

¹ Assume ground ignition is used 60% of the time² Source: Obrien et al., 2003: UH-1 used as a proxy, and it was assumed that aerial ignition is used 40% of the time***Non-Road***

Where,

E_{POL} = Emissions of a particular pollutant (lbs/year)

EF = Emission Factor (lb/hp-hr)

PO = Power Output (hp)

LF = Load Factor (%Max Power)

OT = Operating Time

0.002205 = Conversion from grams to pounds

On-RoadE_{POL} = Emissions of a particular pollutant (lbs/year)

EF = Emission Factor (lb/hp-hr)

VMT = Vehicle Miles Traveled
 0.002205 = Conversion from grams to pounds

Forest Management--Equipment Use

The same equations and assumptions were used to calculate criteria pollutant emissions from forest management equipment use as under equipment use in support of fires. Table A-4 shows the emission factors used for each type of equipment.

Table A-4. Emission Factors used in calculating emissions from Equipment Used in Support of Forest Management

Equipment	CO	NO_x	PM	SO_x	VOC	Units
Pickup trucks(onroad)	38.6	2.5	13.43	0.098	3.4	g/mile
Loader (nonroad) ¹	1	3.3	0.72	1.19	0.2	g/hp-hr
Skidder (nonroad) ²	1	3.3	0.72	1.19	0.2	g/hp-hr
Feller buncher* (nonroad)	1	2.8	0.4	1.07	0.2	g/hp-hr
18 wheeler(onroad)	1.9	1.5	7.8	0.157	1	g/mile
Tractor & roller chopper (nonroad)	1	3.3	0.72	1.19	0.2	g/hp-hr

Source: Obrien et al., 2003

¹ Emission factors for source category: "Forest Equipment" was used

² Equivalent to a John Deere 550

Greenhouse Gases

Calculations are performed to provide greenhouse gases for use in comparing the 2008 INRMP actions to the proposed 2012 INRMP actions. Greenhouse gases emitted from prescribed burns and wildfires, equipment used during fires, timber management and habitat restoration activities are included. Impacts are estimated in tons of carbon dioxide per year for the duration of the proposed action during which greenhouse gas emissions are projected to occur.

Analytical Methods, Calculations and Assumptions

Greenhouse gas emissions were calculated using data provided by Eglin Natural Resources and emissions factors based on USEPA Mandatory Reporting Rule (USEPA 2009). The various greenhouse gas emissions are presented as carbon dioxide-equivalent emissions—a sum that describes the quantity of each greenhouse gas weighted by a factor of its effectiveness as a greenhouse gas, using carbon dioxide as a reference. This is achieved by multiplying the quantity of each greenhouse gas emitted by a factor called the global warming potential. The global warming potential accounts for the lifetime and the radiative forcing of each gas over a period of 100 years (for example carbon dioxide has a much shorter atmospheric lifetime than sulfur hexafluoride; therefore, it has a much lower global warming potential). Global warming potentials (GWP) were based on the Intergovernmental Panel on Climate Change Third Assessment Report (as cited in IPCC 2007).

Prescribed Burning and Wildfires—Fire Emissions

Air emissions from prescribed burns and wildfires are dependent on the size and intensity of the fire, and the type of vegetation being burned. The size and intensity of any fire depend upon the meteorological conditions, the species of vegetation involved and their moisture content, and the

weight of the consumable fuel per acre (available fuel loading). During intense flaming fires, complete combustion occurs and carbon stored in the biomass is converted to CO₂, and nitrogen to N₂O. When combustion is incomplete, for example during smoldering, carbon is released as CO and CH₄. Most of the emissions are CO₂ and CH₄, emissions of N₂O are considered negligible.

GHG emissions of concern from prescribed burning include CO₂ and CH₄. There are currently no available emission factors for N₂O and those emissions are considered to be negligible. Table A-5 shows the emission factors for prescribed burning. These factors are based on the average between a flaming fire and smoldering fire of the lodgepole pine, which was the closest species to the longleaf pine in the study (Ottmar, 2001). The amount of fuel burned can vary greatly from fire to fire, but it was assumed that approximately 3 tons of fuel is burned per acre during a prescribed burn and 9 tons of fuel is burned per acre during a wildfire (USEPA, 1996 [AP-42]). Because of the uncontrollable nature of wildfires, they can spread faster than prescribed burns if started under undesirable weather conditions, and hence burn more fuel.

**Table A-5. GHG Emission Factors
for Prescribed Burning**

GHG	lb/ton of fuel *
CO ₂	3,202
CH ₄	8.2

Source: Ottmar, 2001

*Based on l. pole pine fire average; assuming 3 tons of fuel burned/acre for prescribed burns and 9 tons of fuel burned/acre for wildfires

The equation used to calculate fire emissions is as follows:

where,

E _{POL}	=	Emissions of a particular pollutant (metric tons CO ₂ e)
EF	=	Emission Factor (lb/acre)
AB	=	Acres Burned
GWP	=	Global Warming Potential
2,000	=	Conversion from pounds to short tons
0.90718	=	Conversion from short tons to metric tons

Prescribed Burning and Wildfires--Equipment Use

Various types of equipment are used during prescribed burns and wildfire management. The equipment was classified according to vehicle type categories from the *United States Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis (IERA), Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. (O'brien et al 2003).

The categories are as follows:

- A. *Light Duty Gasoline-Powered Vehicles (LDGV)* - Gasoline-powered vehicles designated for transport of up to 12 people
- B. *Light Duty Gasoline-Powered Trucks (LDGT1)* - Gasoline-powered trucks with a gross vehicle weight less than 6,000 (LDGT1 and LDGT2 were combined into a single category for this assessment.)
- C. *Light Duty Gasoline-Powered Trucks (LDGT2)* - Gasoline-powered trucks with a gross vehicle weight of 6,001 to 8,500 pounds (LDGT1 and LDGT2 were combined into a single category for this assessment.)
- D. *Heavy Duty Gasoline-Powered Vehicles (HDGV)* - Gasoline-powered vehicles with a gross vehicle weight exceeding 8,500 pounds
- E. *Light Duty Diesel-Powered Vehicles (LDDV)* - Diesel-powered vehicles designated for transport of up to 12 people
- F. *Light Duty Diesel-Powered Trucks (LDDT)* - Diesel-powered trucks with a gross vehicle weight of 8,500 pounds or less
- G. *Heavy Duty Diesel-Powered Vehicles (HDDV)* - Diesel-powered vehicles with a gross vehicle weight exceeding 8,500 pounds

It was assumed that during an average wildfire, equipment may include:

- 2 Fire engines (HDDV)
- 2 Tractor (HDDV)
- 2 Tractor Transportation Truck (HDDV)

It was assumed that during an average prescribed burn, equipment used may include:

- 4 Fire engines (HDDV)
- 2 Tractors (HDDV)
- 2 Tractor Transportation Trucks (HDDV)
- 6 ATVs (LDGV)
- 1 Pickup truck (LDDT)

Occasionally, for large burns, a helicopter is used to ignite the fire. It was assumed that this method is used in 25% of the prescribed burns at Eglin.

Table A-6 shows the emission factors for diesel and gas powered vehicles, as well as for the helicopter (JP-8).

Table A-6. Emission Factors for Diesel and Gas Powered Wildland Fire Management Equipment

Fuel Type	HHV ¹ (MMBtu/ gal)	CO ₂ EF ¹ (Kg/ MMBtu)	CH ₄ EF ² (Kg/ MMBtu)	N ₂ O EF ² (Kg/ MMBtu)
Gasoline (MUR)	0.125	70.22	3.00E-03	6.00E-04
Diesel Fuel ULSD	0.138	73.96	3.00E-03	6.00E-04

Fuel Type	HHV ¹ (MMBtu/gal)	CO ₂ EF ¹ (Kg/MMBtu)	CH ₄ EF ² (Kg/MMBtu)	N ₂ O EF ² (Kg/MMBtu)
JP-8	0.135	72.22	3.00E-03	6.00E-04

Source: 1. USEPA, 2009 (Table C-1); 2. USEPA, 2009 (Table C-2)

MMBtu/gal = Million British Thermal Units per gallon; EF = Emission Factor;

Kg/MMBtu = Kilograms per Million British Thermal Units; mt = metric tons;

GWP = Global Warming Potential

The emissions algorithm for diesel and gas powered vehicles is as follows:

$$E_{\text{pol}} = \left(\frac{HHV \times EF \times FC \times HOO \times 2.2 \times GWP}{2000} \right) \times 0.90718$$

E_{pol} = Emissions of a particular pollutant (metric tons CO₂e)

EF = Emission Factor (lb/gal)

HOO = Hours of Operation

FC = Fuel Consumption Rate (gal/hour)

GWP = Global Warming Potential

2,000 = Conversion from pounds to short tons

0.90718 = Conversion from short tons to metric tons

2.2 = Conversion from kg to pounds

A fuel consumption rate of 4 gallons per hour was assumed¹.

For calculating the emissions from the helicopter, the following algorithm was used:

where:

E_{POL} = Emissions of a particular pollutant (metric tons CO₂e)

EF = Emission Factor (lb/1000lb of fuel)

FE = Fuel Consumption (gal/hour)

GWP = Global Warming Potential

2,000 = Conversion from pounds to short tons

0.90718 = Conversion from short tons to metric tons

The fuel consumption was based on a UH-1, and is shown in Table A-7.

Table A-7. Aircraft Fuel Consumption

Engine Type	Aircraft	Fuel Consumption (gal/hour) ¹	Number of Engines per Aircraft
T400-CP-400	UH-1F	88	1

¹USFS, 2011

¹ Fuel consumption varies depending on how the equipment is being used (idling versus moving), therefore, 4 gallons/hour was a conservative estimate based on average equipment operation. Fuel consumption can vary from less than 1 gallon/hour when idling to 8-10 gallons/hour when operating.

Forest Management--Equipment Use

Greenhouse gases will be released from equipment used for siting the area, preparation of the site, and then removing timber and/or reforestation activities. The following are average equipment use for each of these activities assumed for the calculations. For siting, it was assumed that Eglin Natural Resources uses:

- 3 gasoline powered trucks;

For clearing,

- 1 loader
- 2 skidders
- 1 feller buncher
- 3 18 wheelers
- 1 Roller chopper
- 2 gas powered pickup trucks

The algorithm (equation #) and emission factors (Table A-6) used to calculate emissions from diesel and gas powered forest management equipment is the same as that used under wildland fire management equipment.

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APPENDIX B

BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES

ECOLOGICAL ASSETS

Ecological Associations

Four broad matrix ecological associations exist on Eglin AFB: sandhills, flatwoods, wetlands/riparian, and barrier island. The ecosystems are defined by floral, faunal, and geophysical similarities. Artificially maintained urban/landscaped areas and grassland/shrublands also exist within the ROI, primarily on cantonment areas and test areas. Although these areas are not natural ecosystems, they are included in this section types of land use.

Sandhills Matrix

This system is the most extensive natural community type within the ROI. Longleaf pine sandhills are characterized by an open, savanna-like structure with a moderate-to-tall canopy of longleaf pine, a sparse midstory of oaks and other hardwoods, and a diverse groundcover composed mainly of grasses, forbs, and low-stature shrubs. Its structure and composition are maintained by frequent fires (every 3-5 years), which control hardwood, sand pine, and titi encroachment. Longleaf Pine Sandhills consist of a high diversity of species adapted to fire and the heterogeneous conditions that fires create. The dominant native grass species in sandhills within the ROI is either wiregrass or bluestem, depending on location. Sandhills are often associated with and grade into scrub, upland pine forest, xeric hammock, or slope forests. This matrix is also known as longleaf pine turkey oak, longleaf pine-xerophytic oak, longleaf pine-deciduous oak, or high pine (U.S. Air Force, 2007).

The functional significance of the sandhills matrix is to provide maintenance of regional biodiversity. As little as 5,000 acres of old growth longleaf pine forest remains globally and Eglin's Sandhills contain more than any other forest in the world. The Eglin Range represents the largest and least fragmented longleaf pine ownership in the world and has the best remaining stand of old-growth longleaf pine (U.S. Air Force, 2007).

Flatwoods Matrix

Pine flatwoods occur on flat, moderately well drained sandy soils with varying levels of organic matter, often underlain by a hard pan. While the canopy consists of slash pine and longleaf pine, the understory varies greatly from shrubby to an open diverse understory of grasses and herbs. The primary environmental factors controlling vegetation type are soil moisture (soil type and depth to groundwater) and fire history. The average fire frequency in flatwoods is one to eight years, with nearly all of the plants and animals inhabiting this community adapted to recurrent fires. Home to numerous rare and endangered plants and animals, the flatwoods matrix plays a significant role in maintaining regional biodiversity. Eglin's more than 300 acres of old growth flatwoods are among the last remaining of such high quality (U.S. Air Force, 2007).

Wetlands/Riparian Matrix

Wetlands are extraordinarily important contributors to the health and diversity of the Eglin and Hurlburt Field landscapes. Riparian areas are generally found along a water feature such as a river, stream, or creek. Great diversity of invertebrate and fish species is found within the streams associated with these watersheds. At least 11 different plant community types are found within riparian areas of the ROI. Streams are perennial, originating in the sandy uplands of the installation and fed by groundwater recharge. Flood events only occur during extreme rain events (e.g., hurricanes); otherwise, flows are relatively consistent. Temperatures fluctuate during the year and each day, being more constant near the headwaters. These seepage streams are moderately acidic. The specific types of wetlands/riparian matrices found within the ROI are depression wetlands, seepage slopes, and floodplain wetlands (U.S. Air Force, 2007).

Barrier Island

The Eglin barrier island terrestrial area consists of only one vegetative community type, the Coastal Upland Community. Within this community are sand beaches, beach dunes, coastal grasslands, coastal interdunal swales, mesic flatwoods, and scrub. The beach dune community one of the most predominate vegetative communities present, is typified by species of grasses, vines, and herbs. Natural dune vegetation stabilizes sands, allowing for the formation and maintenance of the dune infrastructure, and also provides forage and shelter for a variety of barrier island species. Coastal grasslands are barren sand or sparse to dense groundcover of grasses, prostrate vines, and forbs. Coastal interdunal swales are low-lying, periodically flooded areas containing a high diversity of grasses and sedges. Mesic flatwoods are found in older dune swales. Salt marshes, tidal or mud flats, floodplains, and wetlands are also present within the barrier island complex (U.S. Air Force, 2006).

Urban/Landscaped Areas

This land use predominantly occurs within the main base within the ROI. Bahia grass (*Panicum notatum*) is the primary turf grass that is used in the semi-improved areas while St. Augustine grass (*Stenotaphrum secundatum*) and centipede grass (*Eremochloa ophiuroides*) are the primary turf grasses used in the improved areas. Ground maintenance encourages low-maintenance landscaping and uses native plants whenever possible (U.S. Air Force, 2007).

Grassland/Shrubland

Open grasslands/shrublands occur in areas of heavily disturbed Sandhills, Flatwoods, and Wetlands/Riparian ecological sites. This habitat predominantly occurs within the test areas on Eglin AFB. Grasses and low shrubs characterize open grassland/shrubland areas. Eglin maintains this habitat with machinery or fire that removes or prevents future growth.

Flora and Fauna of Each Habitat Type

Table B-1 provides a summary of some of the plant and animal species commonly found within the habitats described above. The list is not a comprehensive inventory of the species found within these habitats; the table provides a reference summary.

Table B-1. Typical Plant and Animal Species of Eglin AFB by Ecological Association

Plants		Animals	
Common Name	Scientific Name	Common Name	Scientific Name
Sandhills			
Long leaf pine	<i>Pinus palustris</i>	Cottontail rabbit	<i>Sylvilagus floridanus</i>
Turkey oak	<i>Quercus laevis</i>	Bobwhite quail	<i>Colinus virginianus</i>
Blackjack oak	<i>Q. marilandica</i>	Great horned owl	<i>Bubo virginianus</i>
Bluejack oak	<i>Q. incana</i>	Gopher tortoise	<i>Gopherus polyphemus</i>
Wiregrass	<i>Aristida stricta</i>	Pocket gopher	<i>Geomys pinetus</i>
Saw palmetto	<i>Serona repens</i>	Diamondback rattlesnake	<i>Crotalus adamanteus</i>
Bracken fern	<i>Pteridium aquilinum</i>	Six-lined racerunner	<i>Cnemidophorus sexlineatus</i>
Yaupon	<i>Ilex vomitoria</i>	Least shrew	<i>Cryptodius parva</i>
Gallberry	<i>Ilex glabra</i>	Raccoon	<i>Procyon lotor</i>
Pine-woods bluestem	<i>Andropogon arctatus</i>	White-tailed deer	<i>Castor canadensis</i>
Flatwoods			
Longleaf pine	<i>Pinus palustris</i>	Wood duck	<i>Aix sponsa</i>
Saw palmetto	<i>Serona repens</i>	Red-winged blackbird	<i>Agelaius phoenicius</i>
St. John's wort	<i>Hypericum brachyphyllum</i>	Water mocassin	<i>Agkistridon piscivorus</i>
Slash pine	<i>Pinus elliotii</i>	River otter	<i>Lutra canadensis</i>
Black titi	<i>Cliftonia monophylla</i>	Beaver	<i>Castor canadensis</i>
Milkweed	<i>Asclepias humistrata</i>	Florida black bear	<i>Ursus americanus floridanus</i>
Pitcherplant	<i>Sarracenia</i> spp.	Gray fox	<i>Urocyon cinereoargenteus</i>
Wetland and Riparian Areas			
Freshwater			
Yellow water lily	spp.	Raccoon	<i>Procyon lotor</i>
Saw grass	<i>Cladium jamaicensis</i>	Florida black bear	<i>Ursus americanus floridanus</i>
Cattail	<i>Typha domingensis</i>	Sherman's fox squirrel	<i>Sciurus niger shermani</i>
Phragmites	<i>Phragmites australis</i>	American alligator	<i>Alligator mississippiensis</i>
White cedar	<i>Chamaecyparis thyoides</i>	Pine barrens tree frog	<i>Hyla andersonii</i>
Water tupelo	<i>Nyssa biflora</i>	Five-lined skink	<i>Eumeces fasciatus</i>
Pitcher plant	<i>Sarracenia purpurea</i>	Green anole	<i>Anolis carolinensis</i>
Red titi	<i>Cyrilla racemiflora</i>	Garter snake	<i>Thamnophis sirtalis</i>
Tulip poplar	<i>Liriodendron tulipifera</i>	Indigo snake	<i>Drymarchon couperi</i>
Sweet bay magnolia	<i>Magnolia virginiana</i>	American beaver	<i>Castor canadensis</i>
Red bay	<i>Persea borbonia</i>	Parula warbler	<i>Parula americana</i>
Saltwater			
Black needle rush	<i>Juncus roemerianus</i>	Periwinkles	<i>Littorina irrorata</i>
Salt marsh cordgrass	<i>Spartina alterniflora</i>	Oyster	<i>Crassostrea virginica</i>

Table B-1. Typical Plant and Animal Species of Eglin AFB by Ecological Association, Cont'd

Plants		Animals	
Common Name	Scientific Name	Common Name	Scientific Name
Salt meadow hay	<i>Spartina patens</i>	Gulf Crab	<i>Calinectes smilis</i>
Seaside elder	<i>Iva imbricata</i>	Long-nosed killifish	<i>Fundulus similis</i>
Saltgrass	<i>Distichylis spicata</i>	Sheepshead minnow	<i>Cyprinodon variegatus</i>
Wax myrtle	<i>Myrica certifera</i>	America alligator	<i>Alligator mississippiensis</i>
Yaupon holly	<i>Ilex vomitoria</i>	Great blue heron	<i>Ardea herodias</i>
Cattail	<i>Typha angustifolia</i>	Belted kingfisher	<i>Megaceryle alcyon</i>
Palmetto	<i>Serenoa repens</i>	Raccoon	<i>Procyon lotor</i>
Marsh elder	<i>Iva frutescens</i>	Salt marsh rabbit	<i>Sylvilagus aquaticus</i>
Barrier Island			
Sea oats	<i>Uniola paniculata</i>	Ghost crabs	<i>Ocypode quadrata</i>
Godfrey's goldenaster	<i>Chrysopsis godfreyi</i>	Least tern	<i>Sternula antillarum</i>
Scrub oaks	<i>Quercus geminate</i>	Marsh rabbit	<i>Sylvilagus palustris</i>
Beach elder	<i>Iva imbricata</i>	Loggerhead sea turtles	<i>Caretta caretta</i>
Slash pine	<i>Pinus ellioti</i>	Raccoons	<i>Procyon lotor</i>
Yaupon holly	<i>Ilex vomitoria</i>	Water moccasins	<i>Agkistrodon piscivorus</i>

Sensitive Habitats

High Quality Natural Communities

Eglin's contribution to southeastern conservation is evident in its extraordinary biodiversity and the exemplary quality of its many remnant natural communities. While the greater part of the installation is globally significant due to its biodiversity, specific areas have been designated "High Quality Natural Communities" due to their exceptional high quality or the presence of rare species. These areas were identified by the FNAI through a project funded by the Department of Defense (DoD) Legacy Resource Management Program. These areas are distinguished by the uniqueness of the community, ecological condition, species diversity, and/or presence of rare species. These high quality areas, totaling 75,266 acres and covering approximately 16 percent of the installation, are tangible examples of the successful restoration actions of Jackson Guard and the compatibility of these communities with most mission activities (U.S. Air Force, 2007).

Outstanding Natural Areas

From the High Quality Natural Communities FNAI identified, 17 larger-scale landscapes containing complexes of these high quality areas and locations of rare species were named Outstanding Natural Areas, and are listed below (U.S. Air Force, 2007):

- 1) Test Area A-77 Outstanding Natural Area
- 2) Alaqua-Blount Creek Confluence
- 3) Alice Creek
- 4) Boiling Creek/Little Boiling Creek
- 5) Brier Creek
- 6) East Bay Flatwoods and Scrub Mosaic
- 7) Live Oak Creek
- 8) Lower Weaver River
- 9) Patterson Outstanding Natural Area and Extension
- 10) Piney Creek
- 11) Prairie Creek
- 12) Santa Rosa Island (SRI)
- 13) Scrub Pond
- 14) Spencer Flats Wetlands
- 15) White Point
- 16) Whitmier Island
- 17) Yellow River Basin

Significant Botanical Sites

FNAI also identified 15 Significant Botanical Sites that support rare plants on Eglin; they are listed below.

- 1) East Bay Savannahs
- 2) Patterson Natural Area Expansion
- 3) SRI
- 4) Blue Spring Creek Lakes
- 5) Malone Creek
- 6) Titi Creek Wilderness Area
- 7) Live Oak Creek
- 8) Turkey Gobbler Creek Cypress Swamp
- 9) Turkey Hen Creek Swamp
- 10) Boiling Creek and Little Boiling Creek
- 11) Hick's Creek Prairie
- 12) Whitmier Island

- 13) Brier Creek
- 14) Hickory Branch Hardwood Forest
- 15) Piney Creek

Large portions of the Outstanding Natural Areas and the Significant Botanical Sites overlap. Combined, both of these areas total 43,210 acres, or approximately 9 percent of the installation (U.S. Air Force, 2007).

Invasive Non-native Species (INS) Management

INS include plants, animals, insects, diseases, and other organisms that are becoming established and spreading at an alarming rate throughout the world. An invasive species can be defined as a species that is non-native to an ecosystem and whose intentional or accidental introduction causes or is likely to cause environmental or economic damage or harm to human health.

The Eglin AFB INS Management Program focuses on invasive non-native plant and animal species that cause or may cause negative environmental impacts to Eglin ecosystems. Some of the main invasive non-native species of concern are Chinese tallow, cogon grass, Japanese climbing fern, Chinese privet, torpedo grass, feral pigs, and feral cats (U.S. Air Force, 2007). The program's purpose is to protect the integrity of Eglin's natural ecosystems by reducing and controlling the spread of INS. The plan includes a recommendation to limit foot traffic and vehicle traffic in areas where INS are present to prevent the spread of the invasive and exotic species. Equipment moving through these areas needs to be washed so that all seedlings are removed before the equipment is transferred to a non-contaminated area. Standard operating procedures dictate that all vehicles are cleaned prior to use, which would lessen or eliminate the potential for the spread of INS.

Sensitive Species

Table B-2. Sensitive Species at Eglin AFB

Scientific Name	Common Name	Status	
		State	Federal
Fish			
<i>Acipenser oxyrinchus desotoi</i>	Gulf Sturgeon	LT	LT
<i>Awaous banana</i>	River Goby	-	-
<i>Etheostoma okaloosae</i>	Okaloosa Darter	LT	LT
<i>Pteronotropis welaka</i>	Bluenose Shiner	LS	-
Mussels			
<i>Hamiota australis</i>	Southern Sandshell	-	PE
<i>Fusconaia escambia</i>	Narrow Pigtoe	-	PT
Amphibians and Reptiles			
<i>Alligator mississippiensis</i>	American Alligator	LS	T (S/A)
<i>Ambystoma bishopi</i>	Reticulated Flatwoods Salamander	LE	LE
<i>Amphiuma pholeter</i>	One-toed Amphiuma	-	-
<i>Caretta caretta</i>	Atlantic Loggerhead Sea Turtle	LT	LT

Table B-2. Sensitive Species at Eglin AFB, Cont'd

Scientific Name	Common Name	Status	
		State	Federal
<i>Chelonia mydas</i>	Atlantic Green Sea Turtle	LE	LE
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake	-	-
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle	LE	LE
<i>Drymarchon couperi</i>	Eastern Indigo Snake	LT	LT
<i>Eumeces anthracinus</i>	Coal Skink	-	-
<i>Gopherus polyphemus</i>	Gopher Tortoise	LT	LC
<i>Graptemys ernsti</i>	Escambia Map Turtle	-	-
<i>Hemidactylium scutatum</i>	Four-Toed Salamander	-	-
<i>Heterodon simus</i>	Southern Hognose Snake	-	-
<i>Hyla andersonii</i>	Pine Barrens Treefrog	LS	-
<i>Lepidochelys kempii</i>	Kemp's Ridley Sea Turtle	LE	LE
<i>Macrochelys temminckii</i>	Alligator Snapping Turtle	LS	-
<i>Pituophis melanoleucus mugitus</i>	Florida Pine Snake	LS	-
<i>Rana capito</i>	Gopher Frog	LS	-
<i>Rana okaloosae</i>	Florida Bog Frog	LS	-
Birds			
<i>Accipiter cooperii</i>	Cooper's Hawk	-	-
<i>Aimophila aestivalis</i>	Bachman's Sparrow	-	-
<i>Ardea alba</i>	Great Egret	-	-
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	LS	-
<i>Charadrius alexandrinus</i>	Snowy Plover	LT	-
<i>Charadrius melodus</i>	Piping Plover	LT	LT
<i>Charadrius wilsonia</i>	Wilson's Plover	-	-
<i>Egretta caerulea</i>	Little Blue Heron	LS	-
<i>Egretta thula</i>	Snowy Egret	LS	-
<i>Elanoides forficatus</i>	Swallow-tailed Kite	-	-
<i>Eudocimus albus</i>	White Ibis	LS	-
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	LT	-
<i>Haematopus palliatus</i>	American Oystercatcher	LS	-
<i>Haliaeetus leucocephalus</i>	Bald Eagle	LT	BGEPA
<i>Pelecanus occidentalis</i>	Brown Pelican	LS	-
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE	LE
<i>Picoides villosus</i>	Hairy Woodpecker	-	-
<i>Rynchops niger</i>	Black Skimmer	LS	-
<i>Sterna antillarum</i>	Least Tern	LT	-
<i>Sterna caspia</i>	Caspian Tern	-	-
<i>Sterna maxima</i>	Royal Tern	-	-
<i>Sterna sandvicensis</i>	Sandwich Tern	-	-

Table B-2. Sensitive Species at Eglin AFB, Cont'd

Scientific Name	Common Name	Status	
		State	Federal
Mammals			
<i>Peromyscus polionotus leucocephalus</i>	Santa Rosa Beach Mouse	-	-
<i>Trichechus manatus</i>	Manatee	LE	LE
<i>Ursus americanus floridanus</i>	Florida Black Bear	LT*	-
Plants			
<i>Andropogon arctatus</i>	Pine-Woods Bluestem	LT	-
<i>Asclepias viridula</i>	Southern Milkweed	LT	-
<i>Baptisia calycosa</i> var <i>villosa</i>	Pineland Wild Indigo	LT	-
<i>Calamintha dentata</i>	Toothed Savory	LT	-
<i>Calamovilfa curtissii</i>	Curtiss’ Sand Grass	LT	-
<i>Calycanthus floridus</i> var <i>floridus</i>	Sweet Shrub	LE	-
<i>Carex baltzelli</i>	Baltzell’s Sedge	LT	-
<i>Carex tenax</i>	Sandhill Sedge	-	-
<i>Chrysopsis godfreyi</i>	Godfrey’s Golden Aster	LE	-
<i>Chrysopsis gossypina</i> ssp <i>cruiseana</i>	Cruise’s Golden Aster	LE	-
<i>Cladium mariscoides</i>	Pond Rush	-	-
<i>Coelorachis tuberculosa</i>	Piedmont Jointgrass	LT	-
<i>Drosera intermedia</i>	Spoon-Leaved Sundew	LT	-
<i>Eleocharis rostellata</i>	Beaked Spikerush	LE	-
<i>Epigaea repens</i>	Trailing Arbutus	LE	-
<i>Hexastylis arifolia</i>	Heartleaf	LT	-
<i>Hymenocallis henryae</i>	Henry’s Spider Lily	LE	-
<i>Ilex amelanchier</i>	Serviceberry Holly	LT	-
<i>Juncus gymnocarpus</i>	Coville’s Rush	LE	-
<i>Kalmia latifolia</i>	Mountain Laurel	LT	-
<i>Lachnocaulon digynum</i>	Bogbuttons	LT	-
<i>Lilium catesbaei</i>	Pine Lily	LT	-
<i>Lilium iridollae</i>	Panhandle Lily	LE	-
<i>Lilium michauxii</i>	Carolina Lily	LE	-
<i>Lindera subcoriacea</i>	Bog Spice Bush	LE	-
<i>Linum westii</i>	West’s Flax	LE	-
<i>Litsea aestivalis</i>	Pondspice	LE	-
<i>Lupinus westianus</i>	Gulfcoast Lupine	LT	-
<i>Macranthera flammea</i>	Hummingbird Flower	LE	-
<i>Magnolia ashei</i>	Ashe’s Magnolia	LE	-
<i>Magnolia pyramidata</i>	Pyramidal Magnolia	LE	-
<i>Malaxis unifolia</i>	Green Adder’s-Mouth	LE	-

Table B-2. Sensitive Species at Eglin AFB, Cont'd

Scientific Name	Common Name	Status	
		State	Federal
<i>Matela alabamensis</i>	Alabama Spiney Pod	LE	-
<i>Medeola virginiana</i>	Indian Cucumber-Root	LE	-
<i>Monotropa hypopithys</i>	Pine Sap	LE	-
<i>Myriophyllum laxum</i>	Piedmont Water-Milfoil	-	-
<i>Nuphar luteum ssp ulvaceum</i>	West Florida Cow Lily	-	-
<i>Panicum nudicaule</i>	Naked-Stemmed Panic Grass	LT	-
<i>Pinguicula lutea</i>	Yellow Butterwort	LT	-
<i>Pinguicula planifolia</i>	Swamp Butterwort	LT	-
<i>Pinguicula primuliflora</i>	Primrose-Flowered Butterwort	LE	-
<i>Platanthera integra</i>	Southern Yellow Fringeless Orchid	LE	-
<i>Polygonella macrophylla</i>	Large-Leaved Jointweed	LT	-
<i>Quercus arkansana</i>	Arkansas Oak	LT	-
<i>Rhexia parviflora</i>	Small-Flowered Meadow Beauty	LE	-
<i>Rhexia salicifolia</i>	Panhandle Meadowbeauty	LT	-
<i>Rhododendron austrinum</i>	Orange Azalea	LE	-
<i>Rhynchospora crinipes</i>	Hairy-Peduncled Beakrush	LE	-
<i>Rhynchospora stenophylla</i>	Narrow-Leaved Beakrush	LT	-
<i>Sarracenia leucophylla</i>	White-Top Pitcherplant	LE	-
<i>Sarracenia rubra</i>	Sweet Pitcherplant	LT	-
<i>Sideroxylon thornei</i>	Thorne's Buckthorn	LE	-
<i>Stewartia malacodendron</i>	Silky Camellia	LE	-
<i>Tephrosia mohrii</i>	Pineland Hoary Pea	LT	-
<i>Xanthorrhiza simplicissima</i>	Yellow-Root	LE	-
<i>Xyris longisepala</i>	Karst Pond Yellow-Eyed Grass	LE	-
<i>Xyris scabrifolia</i>	Harper's Yellow-Eyed Grass	LT	-
<i>Zigadenus leimanthoides</i>	Coastal Death Camas	LE	-
Lichens			
<i>Cladonia perforata</i>	Florida Perforate lichen	LE	LE

BGEPA = Bald and Golden Eagle Protection Act; LC=Candidate; LE = Endangered; LT = Threatened; LS = Species of Special Concern; PE = Proposed Endangered; PT = Proposed Threatened; T(S/A) = Threatened due to similarity of appearance to a species that is federally listed

- = Not currently listed, but are tracked by FNAI due to rarity.

* = State listed as LT but not applicable in Baker and Columbia counties or the Apalachicola National Forest.

Red-cockaded Woodpecker

The RCW (*Picoides borealis*) is listed as a state and federally endangered bird species. The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. Due to the preservation of continuous longleaf pine forests on Eglin, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin AFB as 1 of 13 primary core populations for the RCW (U.S. Air Force, 2006).

In 2009, the RCW population on Eglin reached the designated recovery goal of 350 Potential Breeding Groups (PBGs) and re-consultation was completed for future management of the species. As of 2011, the population size is 443 active clusters and 401 PBGs (Figure B-1). In addition to the goal of 350 PBGs, NRS personnel have developed a long-term goal of 450 PBGs in order to allow for more mission flexibility. The CCA includes the area required to reach the long term population goal of 450 PBGs.

Eglin maintains geographic information system (GIS) location information for active RCW cavities, which are defined as any tree containing one or more cavities that are utilized by the RCW, and RCW foraging habitat around active clusters of RCW cavities. The Eglin RCW population is divided into the eastern subpopulation, which is comprised of all clusters east of Highway 85, and the western subpopulation, which is comprised of all clusters west of Highway 85. The two populations are demographically separate and each subpopulation is in a different state of health. The western subpopulation is large and increasing (327 PBGs in 2011). The eastern subpopulation is smaller and stable but not increasing (74 PBGs in 2011).

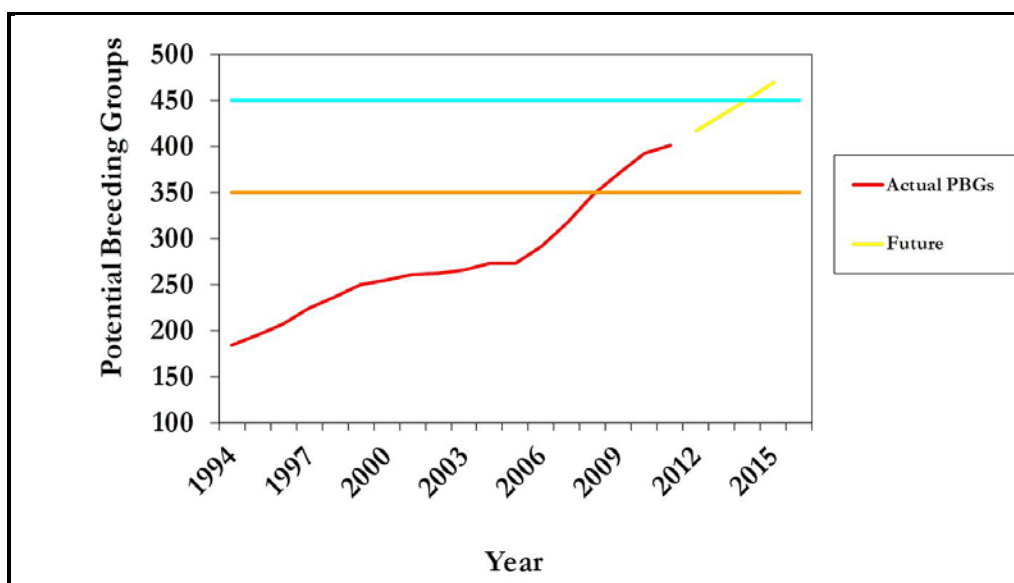


Figure B-1. Eglin RCW Population Trends and Goals

RCW Habitat

High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal (Jackson et al., 1979). Depending on site productivity, different amounts of foraging habitat are required. In systems with medium to high productivity, only 120 acres may be needed whereas sites with low productivity may need 200 to 300 acres of foraging habitat (USFWS, 2003). The NRS has determined that Eglin RCW groups utilize large areas for foraging habitat, thus Eglin generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 in dbh. Site conditions at Eglin

are generally poor; the result is that longleaf pine tends to have smaller dbhs and lower densities than much of the rest of the RCW's range. Good quality foraging habitat on Eglin is defined as habitat that contains between 19 and 33 stems per acre of pines that are greater than 10 in dbh. Another requirement for good quality habitat is that it contains forbs and bunchgrasses in the understory, and has sparse or no hardwood midstory.

Eglin has developed an independent Oracle-based GIS tool (model) that creates foraging habitat assessments, allowing Eglin to consistently and accurately estimate the available foraging resources without sampling the entire Reservation (U.S. Air Force, 2006). The USFWS completed Endangered Species Act Section 7 consultation on the model in June 2003, and concurred with Eglin NRS findings of Not Likely to Adversely Affect. Research has demonstrated that foraging analyses such as Eglin's model accurately portray the actual territories of RCW groups (Convery and Walters, 2004).

The greatest threat to the RCW population is loss and fragmentation of its habitat. If timber is to be removed within 0.5 miles of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines (USFWS, 2003).

Eglin NRS has consulted with the USFWS on the guidelines for the habitat conditions and foraging requirements for RCWs on Eglin. Eglin NRS personnel use the guidelines identified in the *Threatened and Endangered Species Component Plan* (U.S. Air Force, 2006) when determining whether consultation with the USFWS is required. Table B-3 is a comparison of the current Recovery Plan foraging standards and Eglin specific standards.

Table B-3. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers

Measure	USFWS Recovery Standard	USFWS Managed Stability Standard	Eglin Recovery Standard	Eglin Managed Stability Standard
Acres	200-300	75	300	150
Density (stems per acre)	18 > 14 in dbh	None	20 > 10 in dbh	None
Density total (stems per foraging area)	None	None	6,000 > 10 in dbh	3,000 > 10 in dbh
Basal Area (ft ² per acre)	20 > 14 in dbh	40-70 > 10 in dbh	20 > 10 in dbh	None
Basal Area total (ft ²)	None	3,000 > 10 in dbh	6,000 > 10 in dbh	4,000 > 10 in dbh
Distance from cluster	0.5 mile	0.25 mile	0.5 mile	0.3 mile
Midstory height	7 feet	7 feet	7 feet	7 feet
Ground cover	>40% herb	None	> 40% herb	None

> = greater than; < = less than; dbh = diameter at breast height; ft² = square feet; in = inch

The first column contains the values defined in the Recovery Plan as the Recovery Standard for public lands. The second column contains the values defined in the Recovery Plan as the Managed Stability Standard for private lands in order to protect existing groups (USFWS, 2003). The last two columns are recommendations for Eglin's Recovery Standard and Managed Stability Standard. A No Effect determination would be made if a cluster's foraging resources exceed Eglin's Recovery Standard after the completion of a Proposed Action. A Not Likely to Adversely Affect determination would be made if a cluster's foraging resources fall between Eglin's Recovery Standard and Eglin's Managed Stability Standard after the completion of a

proposed action. A Likely to Adversely Affect determination would be made if a cluster's foraging resources fall below Eglin's Managed Stability Standard after the completion of a proposed action. Also, if the proposed action affects less than 1 percent of the foraging resources, and the foraging resources are above Eglin's Managed Stability Standard, then no consultation would be required.

Sea Turtles

Four species of sea turtles are known to nest on SRI and CSB beaches: the Atlantic green sea turtle, Atlantic loggerhead sea turtle, the leatherback sea turtle, and the Kemp's ridley sea turtle. However, the majority of nests on SRI and CSB are from loggerhead sea turtles. The sea turtle nesting and hatching season in northwest Florida occurs from 01 May through 31 October, with most hatching between mid-August and mid-October.

Atlantic Green Sea Turtle

The green sea turtle was listed as federally threatened on 28 July 1978 in all its eastern range of North America, except in Florida where it is listed as endangered. It is also state-listed as endangered. In the United States, it nests in small numbers in Georgia, South Carolina, and North Carolina, and in larger numbers in Florida. The green turtle nesting aggregation in Florida is recognized as a regionally significant colony. The officially recognized nesting and hatching season for the green sea turtle extends from 01 May through 31 October in Florida's panhandle. Eglin AFB SRI property supports the highest number of green sea turtle nests in northwest Florida. Primarily a tropical herbivore, the juveniles are frequently found in the GOM in areas where there is an abundance of seagrass. Peak green sea turtle nesting occurs in June and July, with peak hatching in August and September.

Atlantic Loggerhead Sea Turtle

The loggerhead turtle is federally and state-listed as threatened. On March 16, 2010, the NMFS and USFWS proposed listing of nine distinct population segments of loggerhead sea turtles as endangered or threatened. Loggerhead nests in Florida account for ninety percent of all loggerhead nests in the United States. From March through June, adult loggerheads congregate in the nearshore and offshore waters of the GOM to mate. Their nesting sites are on the numerous barrier islands and beaches between the Florida Keys and the northern GOM. Nesting females approach SRI in the spring and summer to dig their nests between the high tide mark and the dune line and sometimes between dunes. Nest incubation averages seventy-one days. These turtles are the most commonly seen sea turtles in the southeastern United States and may be found near underwater structures and reefs. The diet of loggerheads consists of gastropods, mollusks, coelenterates, and cephalopods. Peak loggerhead nesting on SRI occurs in June and July, and hatching peaks in August and September. Peak loggerhead nesting on CSB occurs in June and July, with hatching peaks in June and July.

Leatherback Sea Turtle

The leatherback sea turtle was originally listed as federally endangered on 2 June 1970 and is considered a state-listed endangered species. This species commonly nests along the shorelines of the Atlantic, Pacific, and Indian Oceans. Only infrequent nesting activity has been

documented for the leatherback in northwest Florida. The officially recognized nesting and hatching season for the leatherback extends from 01 March through 30 September, with nest incubation ranging from sixty to seventy-five days. Until the spring of 2000, the only confirmed leatherbacks nesting in northwest Florida were in Franklin and Gulf Counties. In May and June 2000, leatherback nesting activity was documented for the first time in Okaloosa County on Eglin's portion of SRI. The leatherback feeds primarily on jellyfish, but occasionally will eat sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle was originally listed as federally endangered on 2 December 1970. Adults have the most restricted distribution of any sea turtle and are typically confined to the GOM, while post-pelagic turtles can be found over crab-rich sandy or muddy bottoms. This species commonly nests from April to June along the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America. The Kemp's ridley is a rare nester on Eglin beaches and was documented for the first time in 2008 when three nests were deposited on SRI. One event was witnessed by spectators while the turtle was actually laying her eggs, the other two nests were confirmed by DNA testing. Since the confirmed nesting in 2008, Kemp's have returned to SRI in 2010 and 2011. Eglin Natural Resource biologists believe this is a new trend developing and will consider the Kemp's in the "take" analysis even though there are only a few years of data thus far.

SRI Sea Turtles

Loggerhead nesting peaks in June (Figure B-2). Dividing the average number of nests occurring in June by 30 days yields a peak nesting emergence rate of 0.33 nests per night. By the same method, during a green turtle nesting year, the peak nesting emergence rate is calculated to be 0.15 nests per night (average number of green turtle nests in July, divided by 31 days). The Kemp's Ridley peak nesting rate is calculated to be 0.06 (average number of Kemp's nests in May, divided by 31). To determine the peak nesting rate within a 0.5-mile section of beachfront, the peak nesting emergence rate for each species is divided by the number of 0.5-mile segments comprising Eglin AFB sea turtle nesting beach (i.e., 34). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.01 nests per night per 0.5 mile, the peak rate of green turtle nesting emergences is 0.004 nests per night per 0.5 mile, and the peak rate of Kemp's nesting is 0.001 per 0.5 mile. Because only three leatherback nests have been documented on Eglin AFB SRI over a 22-year period, the leatherback nesting emergence rate is effectively nil.

Cape San Blas Sea Turtles

The loggerhead sea turtle is currently the only documented sea turtle species to nest at CSB; however in recent years adjacent areas to CSB have documented nesting Kemp's ridley sea turtles. Loggerhead nesting peaks in July (Figure B-3). Dividing the average number of nests occurring in July by 31 days yields a peak nesting emergence rate of 0.52 nests per night. To determine the peak nesting rate within a 0.5-mile section of beachfront, the peak nesting emergence rate for each species is divided by the number of 0.5-mile segments comprising CSB sea turtle nesting beach (i.e. 6). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.01 nests per night per 0.5 mile.

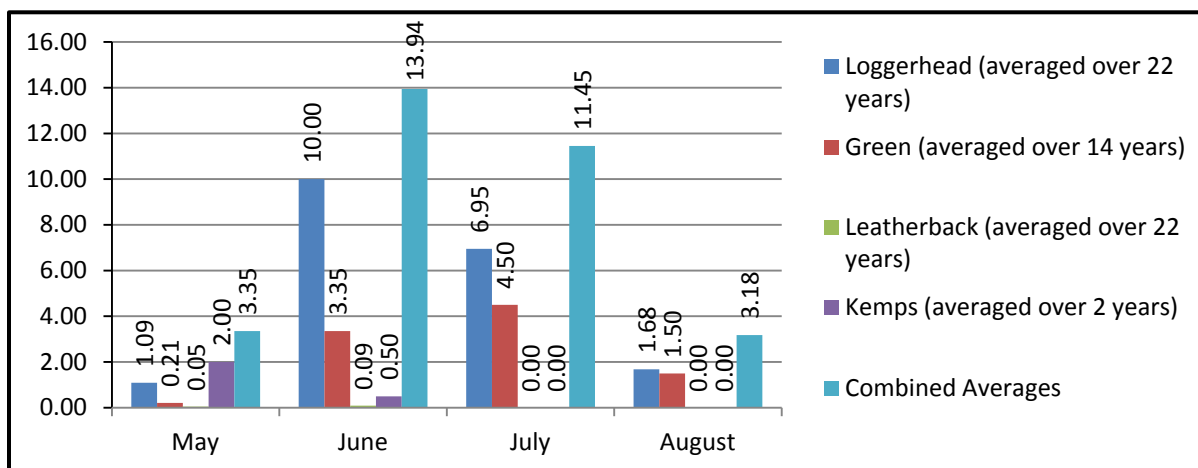


Figure B-2. Average Sea Turtle Nest Occurrences by Month (1989-2010) for SRI, Eglin AFB

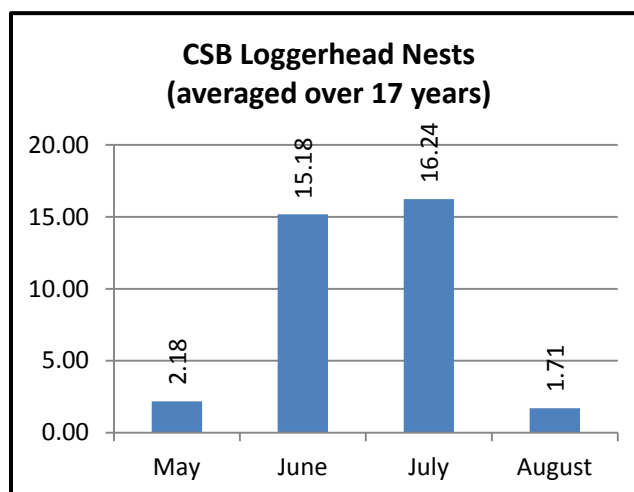


Figure B-3. Average Loggerhead Nest Occurrences by Month (1994-2010) for CSB, Eglin AFB

Reticulated Flatwoods Salamander

The reticulated flatwoods salamander is federally listed as endangered and is a state species of special concern. Based on molecular and morphological analyses, Pauly et al. (2007) proposed the separation of the flatwoods salamander into two species. The division lies along the Apalachicola-Flint Rivers with reticulated flatwoods salamanders (*Ambystoma bishopi*) inhabiting areas to the west and frosted flatwoods salamanders (*A. cingulatum*, federally threatened) ranging to the east of the rivers. There are 20 known breeding ponds for the flatwoods salamander on the Eglin Range. Additionally, the Eglin Range supports approximately 17,000 acres of potential salamander habitat in mesic flatwoods.

Optimal habitat for this small mole salamander is open, mesic (moderately wet) woodlands of longleaf or slash pine flatwoods maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Males and females migrate to these ephemeral ponds during the cool, rainy months of October through December. The females lay their eggs in vegetation at the edges of

the ponds. Flatwoods salamanders may disperse long distances from breeding sites to upland sites where they live as adults.

The primary threat to the flatwoods salamander is loss of mesic habitat through the filling in of wetlands and other alterations to the landscape hydrology. Flatwoods salamander habitat is also threatened by the introduction of invasive, non-native species. Flatwoods salamanders and their active breeding wetlands both appear to have declined in number since the original Eglin surveys in 1993 and 1994. This is possibly due in part to several years of drought in the late 1990s and early 2000s. Wetlands may not have remained wet long enough for larvae to complete metamorphosis if rainfall amounts were not sufficient. This has resulted in little population recruitment over the last decade at Eglin's wetlands.

The U.S. Fish and Wildlife Service (USFWS) guidelines in the Federal Register, dated 1 April 1999, establish a 450-meter (1,476-foot) buffer area from the wetland edge of confirmed breeding ponds. Within the buffer area, the guidelines restrict ground-disturbing activities in order to minimize the potential for direct impacts to salamanders, the introduction and spread of invasive non-native plant species, and alterations to hydrology and water quality.

Okaloosa Darter

The Okaloosa darter is a small federally threatened fish. Spawning occurs from March to October, with the greatest amount of activity taking place during April. The entire global population of this species is found in the tributaries and main channels of Toms, Turkey, Mill, Swift, East Turkey, and Rocky Creeks, which drain into two bayous of Choctawhatchee Bay. These seepage streams have persistent discharge of clear, sand-filtered water through sandy channels, woody debris, and vegetation beds. The Eglin Range contains 90 percent of the 457-square kilometer (176 square mile) drainage area. The remaining portions of the watershed are within the urban areas of Niceville and Valparaiso.

The most immediate threat to the Okaloosa darter is loss of habitat through degradation of stream water quality from soil erosion into streams. The sources with high soil and sediment erosion probability are borrow pits, clay roads that cross streams, and a few test area sites where vegetation is maintained by using choppers on slopes. A 1992 study identified erosion from borrow pits and roads as major contributors to the degradation of darter habitat. Mission activities could avoid further degradation of stream quality by keeping vehicle activity and troop movement confined to trails, bridges, and roads and conducting ground-disturbing activities only outside of a 300-foot buffer around Okaloosa darter streams. These procedures are available to minimize sediment erosion into the darter watersheds and to avoid a consultation process under Endangered Species Act (ESA) regulations (U.S. Air Force, 2006).

The darter was downlisted from endangered to threatened in March of 2011. Eglin AFB is protecting instream flows and historical habitat through management plans, conservation agreements, easements, and/or acquisitions; is implementing an effective habitat restoration program to control erosion from roads, clay pits, and open ranges; is demonstrating that the Okaloosa darter population is stable or increasing and that the range of the Okaloosa darter has not decreased at all historical monitoring sites; and is seeing that no foreseeable threats exist that would impact the survival of the species.

Eastern Indigo Snake

The eastern indigo snake (*Drymarchon couperi*) is listed as a federal and state threatened species, and is the largest non-venomous snake in North America. The primary reason for its listing is population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of others species for over-wintering. The snake frequents flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The indigo snake could occur anywhere on the Eglin Range because it uses such a wide variety of habitats.

The species is extremely uncommon on the Eglin Range with the sighting of only 29 indigo snakes throughout the Eglin Range from 1956 to 1999, and no reported sightings since 1999 (U.S. Air Force, 2006). Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even estimate of the number of these snakes due to the secretive nature of this species.

Gulf Sturgeon and Critical Habitat

The Gulf sturgeon is an anadromous fish that spends part of its life cycle in the marine environment and part in riverine environments. The Gulf sturgeon migrates from salt water into large coastal rivers to spawn and spend the warm months. It lives predominately in the northeastern Gulf of Mexico (GOM), where it ranges from the Mississippi Delta east to the Suwannee River in Florida. However, it can be found in the bays and estuaries throughout this range. Spawning takes place during April through June in fresh water, such as the Yellow River, which borders Eglin AFB along the northwest.

Preliminary data from Eglin/USFWS studies (unpublished at this time) indicate that Gulf sturgeon begin moving to the Gulf in late October/early November. The fish are detected off Eglin's SRI property until approximately mid-December, when they generally migrate east and west out of the area, possibly to aggregation sites that have been detected near Perdido Key, Alabama and near Panama City, Florida. Few fish are detected off Eglin's property between mid-December and mid-March, when the sturgeon begin returning to riverine environments. Initial data show that 82 percent of the detections occurred within approximately 500 meters of the shoreline, in water depth less than 40 feet. Further, 99 percent of detection occurred within approximately 1,000 meters of the shore, in water depths less than 60 feet (only 1 percent of detections occurred in water depths of 60 feet or greater). This data supports the hypothesis that Gulf sturgeon offshore migrations typically occur in water depths of 40 feet or less.

Critical habitat for the Gulf sturgeon was designated in March 2003. *Critical habitat* is a term that refers to specific geographic areas that contain the essential habitat features necessary for the conservation of threatened and/or endangered species. Critical habitat areas may require special protection or management considerations for current populations as well as potential population increases necessary to achieve species recovery. Features include food, water, shelter, breeding areas, and space for growth, among other requirements. In the Final Rule for the designation of critical habitat for the Gulf sturgeon, seven primary constituent elements are identified.

- 1) Abundant food items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for adult and subadult life stages.
- 2) Riverine spawning sites with suitable substrate.
- 3) Riverine aggregation areas (resting, holding, or staging areas).
- 4) Proper stream flow regime for all life stages.
- 5) Adequate water quality for all life stages.
- 6) Adequate sediment quality for all life stages.
- 7) Safe and unobstructed migratory pathways for passage within and between riverine, estuarine, and marine habitats.

Critical habitat for the Gulf sturgeon is comprised of 14 geographic areas, or units. The units collectively encompass almost 2,800 river kilometers and over 6,000 square kilometers of estuarine and marine habitat. As pertains to Eglin, critical habitat is delineated for the Yellow River, East Bay, Santa Rosa Sound, and Choctawhatchee Bay, and extends from the mean high-water line to 1 nautical mile offshore in the GOM at SRI and CSB.

Piping Plover and Critical Habitat

The piping plover (*Charadrius melodus*) is listed as “threatened” by both the State of Florida and federally. This bird’s primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies. Piping plovers are commonly documented during winter in the Florida panhandle, with highest numbers of birds occurring in Franklin, Gulf, and Bay counties. At Eglin the winter foraging period runs from 15 July to 15 May.

Essential habitat features for piping plovers include coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Even though Florida has not been considered a primary wintering area for piping plover, diminishing habitat along other Gulf coast areas may be affording the piping plover new wintering grounds in Florida. These wintering grounds are still considered less suitable, thus forcing the piping plover to utilize isolated patches. As a result, critical habitat has been designated for piping plovers along the Gulf coast of Florida, a portion of which covers SRI North of Test Site A-18. At Cape San Blas, the critical habitat unit includes the area known as the Cape between the eastern boundary of Eglin and mile marker 2.1, including the peninsula and all emerging sandbars. Eglin NRS personnel have also designated other protected areas on SRI that are considered additional protected habitat areas based on historical nesting surveys and are afforded the same protection as designated critical habitat. Eglin has posted designated piping plover critical habitat at SRI and CSB. Posted signs at CSB designate “Endangered Species Habitat” and are designed to prevent driving landward of the signs, thus protecting plovers from vehicle impacts.

Florida Perforate Lichen

Florida perforate lichen (*Cladonia perforata*) is federally listed as “endangered” and has a very restricted population, attributable primarily to a significant loss of its historic habitat. The lichen is endemic to Florida’s white sand scrub habitat dominated by sand pine, rosemary, and other scrub oaks such as sand oak, live oak and myrtle oak. It typically occurs in open areas between patches of scrub vegetation. In addition to habitat loss, it is also threatened by trampling/human disturbance, storm surge overwash, and is susceptible to fire).

In an attempt to protect the known populations, Eglin NRS maintains posted signs and barriers to discourage foot traffic and AF operational activities within the *Cladonia* habitat areas. Additionally, to discourage human disturbance and increase general awareness, informational signs are posted at public beach access points regarding the barrier island ecosystem and the species it supports.

Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is a state threatened species. In December 2008, all DoD entities, including the Air Force, as well as state agencies and other non-governmental organizations (NGO)s, signed a Candidate Conservation Agreement with the USFWS. This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. The Federal Register Vol. 76, No. 144 / Wednesday, July 27, 2011 recently documented the 12-month finding on a petition to list the gopher tortoise as threatened in the eastern portion of its range. The review found that the listing of the gopher tortoise is warranted; however, listing is precluded by higher priority actions. The Federal Register notice also states that it will be added to the federal candidate list and a proposed rule to list the gopher tortoise will be developed as priorities allow.

The gopher tortoise is found primarily within the sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake.

Freshwater Mussels

The southern sandshell (*Hamiota australis*), narrow pigtoe (*Fusconia escambiae*), Choctaw bean (*Villosa choctawensis*), and fuzzy pigtoe (*Pleurobema strodeanum*) freshwater mussels are federal candidates for listing as threatened or endangered species. These freshwater mussels are found only in the Yellow, Escambia, and Choctawhatchee river drainages in Florida and Alabama. From the 1990s to 2004, surveys have documented declines in the numbers of these candidate mussel species (Blalock-Herod et al., 2002; Pilarczyk et al., 2006). Furthermore, these surveys have been unable to capture many of these mussel species at sites where they were previously known to occur. These local extirpations and reductions in numbers are attributed to habitat alteration from various sources. Preferred habitats are creeks and rivers with slow to moderate currents and sandy substrates.

Florida Bog Frog

The Florida bog frog (*Rana okaloosae*) a species of special concern by the state, can only be found within Walton, Okaloosa, and Santa Rosa Counties. Most of the habitat for the frog lies on Eglin AFB property with all known locations of the frog in small tributary streams of the Yellow, Shoal, and East Bay Rivers.

Florida Burrowing Owl

The Florida burrowing owl (*Athene cunicularia floridana*) is a state species of special concern. The owl creates burrows, similar to gopher tortoise burrows, in which to hide from predators. They are typically found in open habitats with short grasses and few trees. These small owls have been seen on many test areas across the Eglin Range, but the confirmed areas are on TA B-70 and TA B-75.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is state-listed and protected by the Bald and Golden Eagle Protection Act. Eagles are territorial and exhibit a strong affinity for a nest site once a nest has been established. It is common for a breeding pair to rebuild damaged or lost nests in the same tree or in an adjacent tree. Individual pairs return to the same territory year after year and territories are often inherited by subsequent generations. The nesting period in the southeast United States extends from 1 October to 15 May with most nests being completed by the end of November. In northwest Florida, most successful nests are laid by mid-February. The quality and amount of forage resources, mainly fish and carrion, heavily influence fledgling survival.

Bald eagles are known to nest in two areas of Eglin AFB: one nest is located in Okaloosa County on the Eglin Main Base Cantonment Area between Cobbs Overrun and Test-Area A-22 on the shore of Choctawhatchee Bay and the second nest is located in Gulf County at CSB. Eglin Natural Resources was permitted in 2011 to remove the nest tree for the eagles located on Main Base due to BASH concerns. The tree was removed on August 23rd, 2011; however eagles have built a new nest in a tree near the area. The original nest tree at Cape San Blas was lost during a tropical storm in 2010, but the eagles have returned to the area and a new nest has been located northeast of the original nesting tree. Another pair of eagles was discovered nesting near St. Joseph Bay at Cape San Blas. There are also three potential unconfirmed nests on Eglin property that were reported in 2009. Due to inaccessibility to these sites, these nests are yet to be confirmed.

Santa Rosa Beach Mouse

The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is one of seven extant beach mouse subspecies, five of which inhabit the panhandle of Northwest Florida. Of the five gulf subspecies, the Santa Rosa subspecies is the only one not currently listed by either the state or the federal government. Beach mice are mostly nocturnal, and burrow nests in dunes. They inhabit frontal dune and scrub habitat within the coastal dune ecosystem on SRI, preferring sand-covered slopes with patches of grasses and herbs, and their diet consists of seeds and fruits of beach plants, as well as insects.

Beginning in 2004, Eglin NRS increased survey frequency and began conducting monthly surveys to determine the severity of the impact of past hurricanes to the population. Since then, preliminary results indicate that beach mice are still present, but additional data is required to determine the status of the current population. Recently, track counts frequency has been reduced to once per quarter. To supplement track-count surveys, Eglin NRS has also incorporated the Florida Fish and Wildlife Conservation Commission (FWC) tracking tube survey protocol. Tracking tube surveys, conducted every six months for all 10 transects now provide data regarding the presence/absence of beach mice in varied ecosystems on Eglin's portion of SRI. This tracking tube method has been developed as a potential alternative to survey for presence/absence of the species. By maintaining both survey types, Eglin NRS hopes to provide comparative data regarding the subjectivity for each method.

Shorebirds

The following protected species of shorebirds are typically found on SRI and CSB:

Common Name	Scientific Name	State Status
American Brown Pelican	<i>Pelecanus occidentalis</i>	SSC
American Avocet	<i>Recurvirostra americana</i>	FNAI-Tracked Species
American Oystercatcher	<i>Haematopus palliatus</i>	SSC
Black Skimmer	<i>Rhynchopsniger</i>	SSC
Caspian Tern	<i>Sterna caspia</i>	FNAI-Tracked Species
Great Egret	<i>Ardea alba</i>	FNAI-Tracked Species
Least Tern	<i>Sterna antillarum</i>	T
Little Blue Heron	<i>Egretta caerulea</i>	SSC
Red Knot*	<i>Calidris canutus</i>	Candidate for Federal Listing
Reddish Egret	<i>Egretta rufescens</i>	SSC
Roseate Spoonbill	<i>Platalea ajaja</i>	SSC
Royal Tern	<i>Sterna maxima</i>	FNAI-Tracked Species
Sandwich Tern	<i>Sterna sandvicensis</i>	FNAI-Tracked Species
Snowy Egret	<i>Egretta thula</i>	SSC
Snowy Plover	<i>Charadrius alexandrinus</i>	T
Tricolor Heron	<i>Egretta tricolor</i>	SSC
White Ibis	<i>Eudocimus albus</i>	SSC
Wilson's Plover	<i>Charadrius wilsonia</i>	FNAI-Tracked Species

*The red knot is described in the section below in greater detail.

Santa Rosa Island

Shorebird nesting season is approximately 01 March through 31 August. Although natural forces including hurricane activity continually change the landscape of SRI, Eglin NRS observes and documents areas that appear to be preferred by nesting shorebirds. In an attempt to designate and protect these areas, Eglin NRS posts signs to discourage foot traffic and mission activities.

Eglin biologists have also conducted a snowy plover banding project on SRI over the past three years. This species has the potential to become federally listed in the near future. Results show that some snowy plovers nest in the same location each year, while others use different locations

in the same general area. Nest site selection is highly variable among birds. Some birds nest on bare sand in flat areas in front of, between, or behind dunes. Others nest on top of dunes in grass, or in rocky areas. Banded birds were seen wintering as far west as Biloxi, Mississippi and as far south as central Florida.

Cape San Blas

Shorebird colonies are found on the eastern shore of CSB, but there are no officially designated shorebird nesting areas. Shorebird surveys from 1994 to 2001 were conducted weekly at Cape San Blas along the shoreline from Indian Pass to the CSB lighthouse. Gulf County volunteers conducted monthly surveys from 2001-2011. In August 2011, Cape San Blas personnel have started conducting weekly shorebird surveys again. CSB personnel are currently collecting GPS data for the Red Knot as it is a candidate for federal listing.

Red knots fly more than 9,300 miles from south to north every spring and repeat the trip in reverse every autumn. Surveys of wintering knots along the coasts of southern Chile and Argentina and during spring migration in Delaware Bay on the U.S. coast indicate a serious population decline. One of the most important is the continued availability of billions of horseshoe crab eggs at major North Atlantic staging areas, notably the Delaware Bay and Cape May peninsula. The increase in taking of horseshoe crabs for bait in commercial fisheries that occurred in the 1990s may be a major factor in the decline in red knots.

CSB personnel are currently, as of 2011, collecting GPS data for the red knot as it is a candidate for federal listing. This data will be important to preclude listing of critical habitat on Air Force property and will be documented in the T&E Species CP to ensure it would meet the requirements for exemption. The red knot conservation measures will likely mimic the piping plover.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the provisions of the MBTA it is unlawful “by any means or manner to pursue, hunt, take, capture or kill any migratory bird except as permitted by regulations issued by the Fish and Wildlife Service. The term “take” is not defined in the MBTA, but the Service has defined it by regulation to mean to pursue, hunt, shoot, wound, kill, trap, capture or collect any migratory bird, or any part, nest or egg or any migratory bird covered by the conventions or to attempt those activities.

Migratory birds pass through the ROI, but Eglin is not considered an important stopover area or concentration site for neotropical migratory birds in the spring or fall (Tucker et al., 1996). Breeding neotropical migrants at Eglin are primarily found in riparian, hammock, and barrier island habitats. These areas can serve as temporary habitat for neotropical birds migrating to and from the Caribbean and South and Central America. Neotropical migrants are more common in the Eglin areas during fall migration than spring migration (Tucker et al., 1996).

REFERENCES:

- Blalock-Herod, H. N., J. J. Herod, and J. D. Williams, 2002. Evaluation of conservation status, distribution, and reproductive characteristics of an endemic Gulf Coast freshwater mussel, *Lampsilis australis* (Bivalvia: Unionidae). *Biodiversity and Conservation*, 11: 1877-1887.
- Convery, K. M., and E. L. Walters, 2004. Estimating species interactions in a woodpecker tree-hole community at the individual, population, and community levels. Dissertation, Florida State University, Tallahassee.
- Jackson, J. A., M. R. Lennartz, and R. G. Hooper, 1979. Tree age and cavity initiation by red-cockaded woodpeckers. *Journal of Forestry*, Vol 77, No 2, pp 102–103.
- Pauly, G. B., O. Piskurek, and H. B. Shaffer. 2007. Phylogeographic concordance in the southeastern United States: the flatwoods salamander, *Ambystoma cingulatum*, as a test case. *Molecular Ecology* 16: 415-429.
- Pilarczyk, M. M., P. M. Stewart, D. N. Shelton, H. N. Blalock-Herod, and J. D. Williams, 2006. Current and Recent historical freshwater mussel assemblages in the Gulf Coastal Plains. *Southeastern Naturalist*, 5(2): 205-226.
- Tucker, J.W., G.E. Hill, and N.R. Holler, 1996. Distribution of Nearctic-Neotropical Migrant and Resident Bird Species Among Habitats at Eglin and Tyndall Air Force Bases, Florida. Alabama Cooperative Fish and Wildlife Research Unit, Auburn University.
- U.S. Air Force, 2006. Threatened and Endangered Species Component Plan for Eglin AFB, FL.
- U.S. Air Force, 2007. INRMP for Eglin AFB, FL.
- U.S. Fish and Wildlife Service (USFWS), 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*), second revision. U.S. Fish and Wildlife Service, Atlanta, GA, 296 pp.

APPENDIX C

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

INTRODUCTION

This document provides the State of Florida with the U.S. Air Force's Consistency Determination under CZMA Section 307 and 15 C.F.R. Part 930 sub-part C. The information in this Consistency Determination is provided pursuant to 15 C.F.R. Section 930.39 and Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, and its implementing regulations at 15 C.F.R. Part 930.

This federal consistency determination addresses the Proposed Action for the implementation of the Integrated Natural Resources Management Plan (INRMP) on Eglin Air Force Base (AFB), Florida (Figure C-1 and Figure C-2).

PROPOSED FEDERAL AGENCY ACTION:

The Proposed Action would refocus the Eglin Natural Resources Section (NRS) program according to the five principal goals from the 2012-2016 INRMP:

- Provide direct support and coordination services by planning for and adapting to a rapidly changing military mission.
- Restore the longleaf pine ecosystem and recover threatened and endangered species in the Core Conservation Area.
- Enable long-term sustainability of barrier island environments for military testing/training by protecting and maintaining threatened and endangered species and their habitats
- Restore, protect, and monitor wetland and aquatic habitats to comply with federal law and recover threatened and endangered species
- Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems

Below is a description of the changes in the NRS program components associated with the Proposed Action.

PRESCRIBED FIRE

The annual prescribed fire acreage would increase slightly over the No Action, and helicopter use and night burning would also increase (Table C-1). The NRS will continue to utilize the Fire Prioritization Model to determine high priority areas for burning. Heightened concern over UXO has recently increased restrictions on fire activities within high probability areas for UXO (Restricted Suppression Areas), limiting access to these areas during active fire and increasing

the no and restricted suppression areas from a baseline of 10,000 acres to approximately 40,000 acres now. No monitors of RC0000W trees are allowed in these areas until after the fire is out.

Table C-1. Annual Average Prescribed Fire and Wildfire Numbers and Size

	No Action	Proposed Action
Prescribed Fires		
Average acres annually	86,000	90,000
Average annual number	120	125
Average size (ac)	720	720
Night burns (#)	5	10
Helicopter Use	Call- in contractor available	Exclusive use of helicopter
Wildfires		
Average acres annually	17,000	
Average annual number	154	
Average size (ac)	60	
Additional wildfire acres within no and restricted suppression areas	8,000	
Firefighters	No new positions	4 new positions
No Suppression and Restricted Suppression Areas		
No Suppression and Restricted Suppression Areas	40,000 acres of no and restricted suppression areas No monitors of RCW trees allowed until after fire complete. No plowing in UXO areas.	

WILDFIRE SUPPORT

The baseline of 110 wildfires totaling 7,000 acres was the average for 2006-2010 (U.S. Air Force, 2011—Fire DSS). An increase in fire-starting missions is anticipated to increase wildfire activity by 40 percent over the baseline, for an average of 154 wildfires totaling 17,000 acres annually (U.S. Air Force, 2012). Restrictions on fire activities within 40,000 acres of no and restricted suppression areas limit access to these areas during active fire and effectively increase the size of wildfires within these areas. The Proposed Action assumes the average wildfire size would remain the same (60 acres), except within the no and restricted suppression areas, where a 20 percent increase in the size of wildfires over the baseline is expected. The Proposed Action also assumes 8,000 additional wildfire acres within no and restricted suppression areas. The Proposed Action includes the assumption of increased manpower by hiring four additional firefighters to maintain adequate response time and fire containment.

FOREST MANAGEMENT

Under the Proposed Action, forest management would continue to support sustainable forest management practices and protected species habitat restoration (Table C-2). Updated priorities have shifted additional efforts to sand pine removal activities and planting/natural regeneration.

Table C-2. Forest Management

Activity	No Action Acres (acres/year)	Proposed Action (acres/year)
Timber Management/Restoration		
Invasive Sand Pine Removal	3,000	3,000
Sand Pine Plantation Removal	500	500
Stunted Slash Pine Plantation Removal	1,500	800
Slash Pine Plantation Thinning/Conversion	325	325
Longleaf Pine Thinning	4,500	3,000
Sand Pine Seed Tree	500	500
Timber Stand Improvement		
Sand Pine Removal TSI (brush saw/chainsaw)	3,500	6,000
Herbicide (chemical) TSI	3,000	1,000
Reforestation		
Site Preparation	1,500	2,500
Planting and Natural Regeneration	1,500 (planting only)	4,000 (planting and natural regeneration)

TSI = timber stand improvement

Habitat Restoration

INPS control, erosion control, and fish passage restoration projects would continue under the Proposed Action (Table C-3). Erosion control work would shift in focus from Okaloosa darter streams to Gulf sturgeon and Clean Water Act watersheds. There are fewer sites under the Proposed Action because there are fewer priority sites as NRS continues to restore sites.

Table C-3. Habitat Restoration

Activity	No Action	Proposed Action
Erosion Control and Fish Passage Restoration		
T&E erosion control sites	25 sites/year	20 sites between 2012 and 2014
Fish passage restoration (number/5 years)	2	2
CWA erosion control sites (number/year)	5	5
Maintain all rehabilitated erosion sites for 3-5 years (number/year)	110	110
Invasive Non-native Plant Species		
INPS surveys	Annual FNAI surveys	Annual FNAI surveys
INPS treatment	Annually treat 90 % of sites located during previous years' surveys in HQNA within 1 mile of urban interface	Annually treat 90 % of sites located during previous years' surveys in HQNA within 1 mile of urban interface

INPS = invasive non-native plant species; CWA = Clean Water Act; T&E = threatened and endangered; FNAI = Florida Natural Areas Inventory; HQNA = high-quality natural area

NUISANCE AND NON-NATIVE ANIMAL MANAGEMENT AND BASH

Nuisance and non-native animal management and bird/wildlife aircraft strike hazard (BASH) activities would continue under the Proposed Action (Table C-4).

Table C-4. Nuisance and Non-Native Animal Management and BASH

Activity	No Action	Proposed Action
Feral hogs	Hog surveys in flatwoods salamander ponds, steepheads, and seepage slopes Hog control as needed in sensitive habitats	Hog surveys in flatwoods salamander ponds, steepheads, and seepage slopes Hog control as needed in sensitive habitats
SRI predator control	Biannual predator track counts and follow-up control efforts by USDA	Biannual predator track counts and follow-up control efforts by USDA
Nuisance animal responses	As needed	As needed
BASH responses	USDA manages	USDA manages

BASH = bird/wildlife aircraft strike hazard; USDA = U.S. Department of Agriculture

ECOLOGICAL MONITORING

The NRS would continue to monitor key communities and their response to management activities to better inform future management decisions (Table C-5). Remote sensing and spatial modeling tools would continue to be used as a component of this program.

Table C-5. Ecological Monitoring

	No Action	Proposed Action
Longleaf Pine Sandhills and Flatwoods	200 1-hectare plots sampled one growing season after management activity, or at least every 5 years	200 1-hectare plots sampled one growing season after management activity, or at least every five years
Seepage Slopes	28 slopes monitored on 4-year cycle	28 slopes monitored on 4-year cycle
Steephead Streams	32 steepheads monitored on 4-year cycle	32 steepheads monitored on 4-year cycle
Biological, chemical, and physical stream surveys	Annual assessments in tributaries to Yellow and Shoal Rivers Before and after restoration sampling (6 months, 1 year, 5 years) at 10 sites	Annual assessments in tributaries to Yellow and Shoal Rivers Before and after restoration sampling (6 months, 1 year, 5 years) at 10 sites

Protected Species Management and Monitoring

Under the Proposed Action, protected species management and monitoring efforts would remain focused on the 11 federally listed and select state-listed species present on the Eglin Reservation. To protect migratory bird species, Eglin NRS will continue with surveys and impact minimization measures for military activities (Table C-6). The NRS would also continue to support the military mission by conducting Endangered Species ESA and MMPA consultations, participating in the EIAP process, and improving Eglin's process for tracking implementation of natural resources requirements (Table C-6).

Table C-6. Protected Species Management and Monitoring

Species	No Action	Proposed Action
Mainland Eglin		
RCW	<p>Focused on 350 MEA.</p> <p>Annually conduct tree checks on all active cluster and inactive recruitment clusters; conduct group check on 33% of active clusters annually.</p> <p>Cavity inserts.</p> <p>Translocation.</p> <p>Prescribed fire, forest management, ecological monitoring.*</p>	<p>Focused on CCA and 450 MEA, particularly on the east side.</p> <p>Annually conduct tree checks on all active cluster and inactive recruitment clusters; conduct group check on 25% of active clusters annually.</p> <p>Cavity inserts.</p> <p>Translocation.</p> <p>Prescribed fire, forest management, ecological monitoring.*</p>
Reticulated flatwoods salamander	<p>100% annual dip net sampling of known ponds (18 ponds).</p> <p>Years when known sites occupied, resample 20-50 % of potential ponds.</p> <p>Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management.*</p>	<p>100% annual dip net sampling of known ponds (20 ponds as of 2012).</p> <p>Years when known sites occupied, resample 20-50 % of potential ponds.</p> <p>Mid-story hardwood control.</p> <p>Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management.*</p>
Okaloosa darter	<p>Visual surveys within a 20-meter reach at each of 28 sites.</p> <p>Ecological monitoring, habitat restoration, and nuisance and non-native species management.*</p>	<p>Visual surveys within a 20-meter reach at each of 28 sites.</p> <p>Ecological monitoring, habitat restoration, and nuisance and non-native species management.*</p>
Gulf sturgeon	<p>Summer tracking in rivers and bays.</p> <p>Winter tracking in Gulf, bays.</p> <p>Habitat restoration.*</p>	<p>Summer tracking in rivers and bays.</p> <p>Winter tracking in Gulf, bays.</p> <p>Habitat restoration.*</p>
Indigo snake	<p>Pre-land disturbing project surveys and relocation if found.</p> <p>Prescribed fire.*</p>	<p>Pre-land disturbing project surveys and relocation if found.</p> <p>Prescribed fire.*</p>
Freshwater mussels	Habitat restoration.*	Annual surveys in rivers adjacent to Eglin. Habitat restoration.*
Gopher tortoise	<p>Monitor all known gopher tortoise populations at 3-5 year intervals.</p> <p>Pre-land disturbing project surveys and relocation.</p> <p>Prescribed fire.*</p>	<p>Annually monitor status of 20% of known tortoise burrows from previous surveys.</p> <p>Low intensity monitoring program.</p> <p>Pre-land disturbing project surveys and relocation.</p> <p>Maintain relocation sites.</p> <p>Prescribed fire. *</p>
Bald eagle	<p>Weekly survey during nesting season at nests accessible by foot.</p> <p>Post primary zone (330 feet) around bald eagle nests during the nesting season.</p>	<p>Weekly survey during nesting season at nests accessible by foot.</p> <p>Post primary zone (330 feet) around bald eagle nests during the nesting season.</p>
Florida burrowing owl	<p>Monthly surveys.</p> <p>Maintain T perches.</p> <p>Trims vegetation around burrows where necessary.</p> <p>Prescribed fire.*</p>	<p>Monthly surveys during breeding season.</p> <p>Maintain T perches.</p> <p>Trims vegetation around burrows where necessary.</p> <p>Prescribed fire. *</p>

Table C-6. Protected Species Management and Monitoring, Cont'd

Species	No Action	Proposed Action
Florida black bear	Assistance with nuisance bear complaints. Maintain sightings/mortalities database.	Assistance with nuisance bear complaints. Maintain sightings/mortalities database.
Florida bog frog	100% annual resurvey of known bog frog locations with three visits to each site. Sample potential new sites once every 3 years. Prescribed fire, habitat restoration, and nuisance and non-native species management.*	100% annual resurvey of known bog frog locations with three visits to each site. Annually resample a portion of sites in close proximity to known sites where bog frogs have not been found. Prescribed fire, habitat restoration, and nuisance and non-native species management.*
Migratory birds	Surveys prior to tree removal at certain times of year. Screening of inactive RCW trees to ensure migratory species do not occupy these trees prior to removal. Roof surveys for least tern colonies. Survey for and post shorebird nests on SRI for mission avoidance. Mark "T" perches for burrowing owls. Remove excess woody vegetation directly adjacent to active burrowing owl burrows. Post a 330-foot buffer around bald eagle nests during nesting season.	Surveys prior to tree removal at certain times of year. Screening of inactive RCW trees to ensure migratory species do not occupy these trees prior to removal. Roof surveys for least tern colonies. Survey for and mark shorebird nests on SRI for mission avoidance. Mark "T" perches for burrowing owls. Remove excess woody vegetation directly adjacent to active burrowing owl burrows. Post a 330-foot buffer around bald eagle nests during nesting season.
Santa Rosa Island and Cape San Blas		
Sea turtles	Daily monitoring May 1 to Oct 31. Mark and place protective screening over all nests at SRI. Nuisance and non-native species management.*	Daily monitoring May 1 to Oct 31 Mark and place protective screening over all nests at SRI. Nest sitting to direct disoriented hatchlings to water at SRI. Ensure continued compliance of Gulf County with the real-estate lease which outlines the restrictions for beach driving on Cape San Blas. Nuisance and non-native species management.*
<i>Cladonia</i>	Population estimate every 5 years; more often if major storm event. Maintain fencing and posting at 4 sites. Habitat restoration.*	Population estimate every 5 years; more often if major storm event. Maintain fencing and posting at 4 sites. Habitat restoration.*
Piping plover	Surveys every two weeks from July to May at half-mile intervals on south side of SRI, and appropriate habitat on north side. Maintain posting at one habitat area on SRI.	Surveys every two weeks from July to May at half-mile intervals on south side of SRI, and appropriate habitat on north side. Maintain posting at 3 habitat areas on SRI. Establish closed area posting on north side of SRI.
Santa Rosa beach mouse	Annually conduct four track count surveys and four tracking tube surveys at 10 transects. Nuisance and non-native species management.*	Conduct one sand track count survey every quarter, and conduct tracking tube surveys once every six months at 10 predetermined transects. Nuisance and non-native species management.*

Table C-6. Protected Species Management and Monitoring, Cont'd

Species	No Action	Proposed Action
Shorebirds	Survey every two weeks from Oct-Aug at SRI. Monthly survey at CSB. Weekly nesting surveys from March to July. Mark nests potentially impacted by the public or mission activities. Nuisance and non-native species management.*	Survey every two weeks year-round at SRI Monthly survey at CSB Weekly nesting surveys from March to July Mark nests potentially impacted by the public or mission activities. Nuisance and non-native species management.*

CSB = Cape San Blas; MEA = management emphasis area; RCW = red-cockaded woodpecker; SRI = Santa Rosa Island

* Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management activities that benefit T&E species are covered in those respective sections.

Recreation Management

Eglin supports a variety of recreational opportunities (Table C-7). Eglin's hunting management units were restructured prior to the 2010-2011 season. The units have been re-designated to create seven larger units. Additionally, the area surrounding the 7SFG(A) cantonment, formerly Management Units 6B and 6C, has been closed to all forms of public recreation, with the exception of the Duck Pond area, which is still open for recreation but closed to hunting. Another change to the recreation program is the introduction of a daily public access map (PAM), which informs the public via the Internet of short-term closure of open recreational areas. Prior to entering the Reservation, all recreationalists must first view the PAM to verify area availability.

Federal Consistency Review

Statutes addressed as part of the Florida Coastal Zone Management Program consistency review and considered in the analysis of the Proposed Action are discussed in Table C-8.

Pursuant to 15 C.F.R. § 930.41, the Florida State Clearinghouse has 60 days from receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 C.F.R. § 930.41(b). Florida's concurrence will be presumed if Eglin AFB does not receive its response on the 60th day from receipt of this determination.

Table C-7. Recreation Management

Activity	No Action	Proposed Action
Hunting and Fishing		
Available hunting acres	248,321	248,321
Quail management emphasis area	Herbicide treatment for 100 acres annually	Herbicide treatment for 100 acres annually
Timberlake dove fields	None	Reestablish LLP on portions of Timberlake dove fields and buffer
Special opportunity hunts	Mobility impaired, youth, and turkey special hunts	Mobility impaired, youth, and commanders special hunts
Fishing	29 ponds, 252 acres, four ponds stocked with grass carp for weed control	29 ponds, 252 acres, four ponds stocked with grass carp for weed control
Annual youth fishing rodeo	One annually, 200 youth participants	One annually, 200 youth participants
High-intensity pond management	Maintain high intensity management of Indigo and Duck ponds	Maintain high intensity management of Indigo and Duck ponds; establish Anderson Pond as high intensity by 2013
Recreational impoundment spillway structure renovation	One annually	One annually
Non-consumptive Recreation		
Camp sites and day use areas	Manage 15 primitive camp sites and nine day use areas	Manage 15 primitive camp sites and nine day use areas
Florida Scenic Trail	Florida Trail Association (FTA) is responsible for trail maintenance; 8 campsites	FTA is responsible for trail maintenance; 8 campsites; FTA to finish last of trail on Eglin
Timberlake bike trail system	26 miles of trails	26 miles of trails
Beach access	Official beach access points/4 miles public beach @SRI and 3 miles @ CSB; CSB allows beach driving on non-interference basis. Beaches are closed to activities from sunset to sunrise—signs will be made and posted at each access point.	Official beach access points/4 miles public beach @SRI and 3 miles @ CSB; CSB allows beach driving on non-interference basis. Beaches are closed to activities from sunset to sunrise—signs will be made and posted at each access point.
Canoeing	Trims low branches on Turkey, Rocky, Alaqua, and Boiling Creeks	Trims low branches on Turkey, Rocky, Alaqua, and Boiling Creeks

CBS = Cape San Blas; FTA = Florida Trail Association; SRI = Santa Rosa Island

Table C-8. Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	The Proposed Action would not affect beach and shore management, specifically as it pertains to: The Coastal Construction Permit Program. The Coastal Construction Control Line (CCCL) Permit Program. The Coastal Zone Protection Program. All activities would occur on federal property.	This statute provides policy for the regulation of construction, reconstruction, and other physical activities related to the beaches and shores of the state. Additionally, this statute requires the restoration and maintenance of critically eroding beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	The Proposed Action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	State and regional agencies will be provided the opportunity to review the INRMP EA. The Proposed Action would not affect state plans for water use, land development or transportation.	Details state-level planning efforts. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	The Proposed Action would not affect the state's vulnerability to natural disasters. The Proposed Action would not affect emergency response and evacuation procedures.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	All actions will take place within Eglin property. Therefore, the Proposed Action would not negatively affect state lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i>	All actions would take place within Eglin property. Therefore, the Proposed Action would not negatively affect state parks, recreational areas and aquatic preserves.	Addresses administration and management of state parks and preserves.
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	The Proposed Action would not affect state tourism and/or outdoor recreation.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.

Table C-8. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 260 <i>Florida Greenways and Trails Act</i>	Florida Trail Association (FTA) is responsible for trail maintenance and eight campsites on Eglin AFB. The daily Public Access Map (PAM), available via the Internet, provides information to the public of short-term closure of open recreational areas. Prior to entering the Reservation, all recreationalists must first view the PAM to verify area availability. Therefore, the Proposed Action would not affect the Greenways and Trails Program.	Established in order to conserve, develop, and use the natural resources of Florida for healthful and recreational purposes.
Chapter 267 <i>Historical Resources</i>	For prescribed fire activities: 96 CEG/CEVSN and 96 CEG/CEVSH coordinate annual work plans to avoid potential impacts to cultural resources areas. For forestry activities: Two fiscal years in advance of a sale, forestry personnel from 96 CEG/CEVSN provide Eglin AFB Cultural Resources with maps of proposed timber sale tracts. In the case of unexpected discoveries occurring during this activity, all actions in the immediate area will cease and efforts will be taken to protect the find from further impact, and the 96 CEG/CEVSH will be contacted. Further potential impacts to cultural resources are addressed in Chapter 3, Section 3.8 of the EA. The Proposed Action would be consistent with Florida's statutes and regulations regarding the state's archaeological and historical resources.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The Proposed Action would occur on federal property and would not affect future business opportunities on state lands, or the promotion of tourism in the region.	Promotes and develops general business, trade, and tourism components of the state economy
Chapter 334 <i>Transportation Administration</i>	The Proposed Action would not affect the planning needs of the state's transportation administration.	Addresses the state's policy concerning transportation administration.
Chapter 339 <i>Transportation Finance and Planning</i>	The Proposed Action would not affect the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system.

Table C-8. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
<p>Chapter 373 <i>Water Resources</i></p>	<p>The Proposed Action would minimize potential impact of Wildfire support activity to surface water, wetlands, and floodplains. NRS would minimize impacts to water resources by following its policy for no plowing in biologically sensitive areas (i.e., within 100 ft of streams or in wetlands).</p> <p>The Proposed Action would continue forestry operations such as clearing, site-prep and tree planting to achieve timber removal, reforestation, and native understory restoration. Potential for erosion at disturbed sites and the potential for short-term impacts surface water would be minimized by implementing the following practices in the Forestry Management Component Plan:</p> <p>NRS managers implement Florida's Best Management Practice for Silviculture (FDOA, 2011) in all forestry operations, and the manual is included in the Forestry Management Component Plan.</p> <p>Commercial contractors retained to harvest timber on the Eglin Reservation are monitored by NRS for site prep/tree removal regulatory and best management compliance.</p> <p>Further potential impacts to cultural resources are addressed in Chapter 3, Section 3.3 of the EA.</p> <p>Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the water resources of the state.</p>	<p>Addresses sustainable water management; the conservation of surface and ground waters for full beneficial use; the preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians.</p>
<p>Chapter 375 <i>Outdoor Recreation and Conservation Lands</i></p>	<p>The Proposed Action would not affect opportunities for recreation on state lands.</p>	<p>Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs.</p>
<p>Chapter 376 <i>Pollutant Discharge Prevention and Removal</i></p>	<p>The Proposed Action would not affect the transfer, storage, or transportation of pollutants.</p>	<p>Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.</p>
<p>Chapter 377 <i>Energy Resources</i></p>	<p>The Proposed Action would not affect energy resource production, including oil and gas, and/or the transportation of oil and gas.</p>	<p>Addresses regulation, planning, and development of oil and gas resources of the state.</p>

Table C-8. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 379 <i>Fish and Wildlife Conservation</i>	Eglin AFB Natural Resources Section is currently conducting a formal consultation with the USFWS under Section 7 of the ESA in regards to protected species. All terms and conditions resulting from this consultation would be followed. Further potential impacts to biological resources are addressed in Chapter 3, Section 3.4 of the EA. Therefore the Proposed Action would be consistent with the state's protection of fish and wildlife resources.	Addresses the management and protection of the state of Florida's wide diversity of fish and wildlife resources.
Chapter 380 <i>Land and Water Management</i>	The Proposed Action would occur on federally owned lands. Under the Proposed Action, development of state lands with regional (i.e. more than one county) impacts would not occur. No changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would occur.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	The Proposed Action would not affect the state's policy concerning the public health system.	Establishes public policy concerning the state's public health system.
Chapter 388 <i>Mosquito Control</i>	The Proposed Action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	Water resources would benefit from continued erosion control activities, road closure/rehabilitation, and borrow pit reclamation. With BMP implementation, forest management, wildfire support, and habitat restoration activities would have no significant impacts associated with erosion. With implementation of management requirements, no adverse impacts associated with the use of herbicides are anticipated. Further potential impacts to cultural resources are addressed in Chapter 3, Section 3.3 of the EA. An increase in prescribed burning activity under the Proposed Action would slightly increase the potential for adverse impacts to air quality. However, potential impacts would be temporary. Further potential impacts to air quality are addressed in Chapter 3, Section 3.1 of the EA. Therefore, the Proposed Action would not affect water quality, air quality, pollution control, solid waste management, or other environmental control efforts.	Establishes public policy concerning environmental control in the state.

Table C-8. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
<p>Chapter 582 <i>Soil and Water Conservation</i></p>	<p>Although NRS management activities may occur in floodplains, NRS engages in management strategies that minimize potential impacts to these areas, such as only using rubber tired vehicles in floodplain areas and implementing buffer zones in areas prone to flooding for chemical applications associated with vegetation management. As a result, potential impacts to floodplains would be minimal, with no major, long-term impacts to the quality, utility, or dynamics of floodplains on Eglin.</p> <p>Continued erosion control measures would minimize erosion from forestry, fire, and habitat restoration activities. Erosion control projects will benefit landforms and soils of the Eglin Reservation.</p> <p>Therefore, the Proposed Action would be consistent with soil and water conservation efforts.</p>	<p>Provides for the control and prevention of soil erosion.</p>



Figure C-1. The Eglin Military Complex

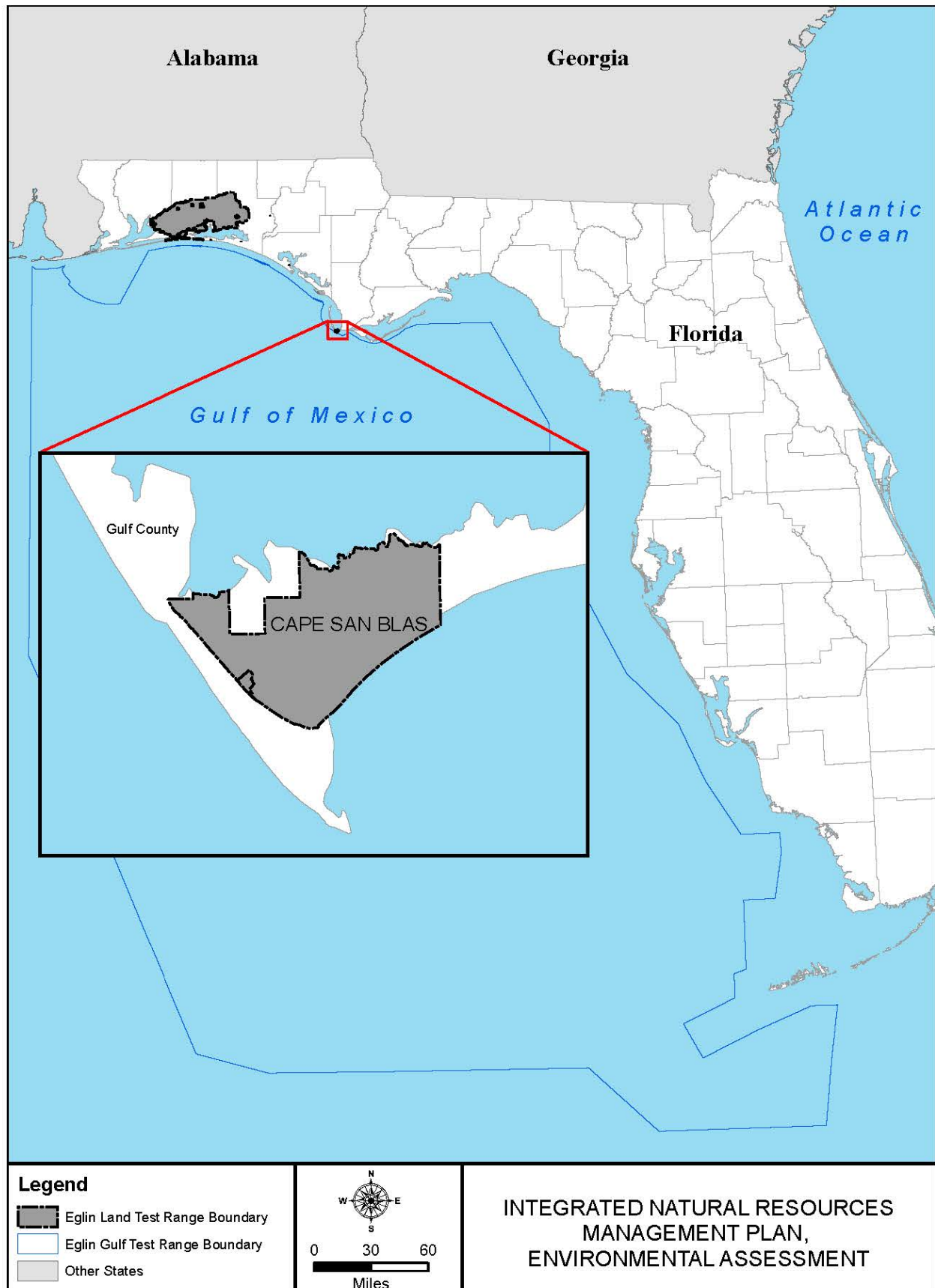


Figure C-2. Location of Cape San Blas, Florida

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APPENDIX D

SECTION 7 CONSULTATION WITH U.S. FISH AND WILDLIFE SERVICE

BIOLOGICAL ASSESSMENT

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 96TH AIR BASE WING (AFMC)
EGLIN AIR FORCE BASE FLORIDA

Mr. Bruce Hagedorn
Chief, Natural Resources Section
96 CEG/CEVSN
501 De Leon Street, Suite 101
Eglin AFB FL 32542-5133



Dr. Donald Imm
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City FL 32405

Dear Dr. Imm:

The following document is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This biological assessment (BA) addresses potential impacts to all federally listed threatened and endangered (T&E) species associated with the proposed action in the Eglin AFB *Integrated Natural Resources Management Plan (INRMP)*. The analysis provides a determination of potential impacts to federally listed T&E species and identifies avoidance and minimization measures to lessen potential impacts. Because some INRMP activities have the potential to adversely affect T&E species, this BA is meant to initiate Section 7 consultation with the USFWS.

Eglin AFB would notify the USFWS immediately if it modifies any of the actions considered in this Proposed Action or if additional information on listed species becomes available, as the USFWS may require a reinitiation of consultation. Eglin would implement any modifications or conditions resulting from consultation with the USFWS. Thank you in advance for your support and cooperation and if you have any questions regarding this BA or any of the proposed activities, please do not hesitate to contact me at 850-882-8421.

Sincerely,


BRUCE HAGEDORN, GS-13
Chief, Natural Resource Section

**EGLIN AIR FORCE BASE
Florida**

**U.S. FISH AND WILDLIFE
SERVICE**

FINAL

**FORMAL ENDANGERED SPECIES ACT
SECTION SEVEN CONSULTATION
FOR INTEGRATED NATURAL
RESOURCES MANAGEMENT PLAN
ACTIVITIES AT EGLIN AFB, FL**

APRIL 2012



PRINTED ON RECYCLED PAPER

TABLE OF CONTENTS

	<u>Page</u>
List of Tables.....	ii
List of Figures.....	iii
Acronyms, Abbreviations, and Symbols.....	iv
1. INTRODUCTION.....	1-1
2. DESCRIPTION OF PROPOSED ACTION.....	2-1
2.1 Introduction.....	2-1
2.2 Overview of Management Activities.....	2-2
2.2.1 Prescribed Fire.....	2-2
2.2.2 Wildfire Support.....	2-3
2.2.3 Forest Management.....	2-3
2.2.4 Habitat Restoration.....	2-4
2.2.5 Nuisance and Non-native Animal Management.....	2-5
2.2.6 Ecological Monitoring.....	2-5
2.2.7 Protected Species Management and Monitoring.....	2-6
2.2.8 Recreation Management.....	2-8
2.2.9 Conservation Measures.....	2-8
3. BIOLOGICAL INFORMATION.....	3-1
3.1 Federally Listed Species.....	3-1
3.1.1 Red-cockaded Woodpecker.....	3-1
3.1.2 Sea Turtles.....	3-8
3.1.3 Reticulated Flatwoods Salamander.....	3-14
3.1.4 Okaloosa Darter.....	3-15
3.1.5 Eastern Indigo Snake.....	3-15
3.1.6 Gulf Sturgeon and Critical Habitat.....	3-16
3.1.7 Piping Plover and Critical Habitat.....	3-17
3.1.8 Florida Perforate Lichen.....	3-17
3.1.9 Freshwater Mussels.....	3-18
3.2 Other Species Considered.....	3-18
3.2.1 Gopher Tortoise.....	3-18
3.2.2 Florida Bog Frog.....	3-18
3.2.3 Florida Burrowing Owl.....	3-19
3.2.4 Bald Eagle.....	3-19
3.2.5 Santa Rosa Beach Mouse.....	3-19
3.2.6 Shorebirds.....	3-20
3.2.7 Red Knot.....	3-21
4. EFFECTS DETERMINATION.....	4-1
4.1 Federally Listed Species.....	4-1
4.1.1 Red-cockaded Woodpecker.....	4-1
4.1.2 Sea Turtles.....	4-7
4.1.3 Reticulated Flatwoods Salamander.....	4-8
4.1.4 Okaloosa Darter.....	4-9
4.1.5 Eastern Indigo Snake.....	4-11
4.1.6 Gulf Sturgeon and Critical Habitat.....	4-12
4.1.7 Piping Plover and Piping Plover Critical Habitat.....	4-13
4.1.8 Florida Perforate Lichen.....	4-14
4.1.9 Freshwater Mussels.....	4-15
4.2 Other Species Considered.....	4-16
4.2.1 Gopher Tortoise.....	4-16
4.2.2 Florida Bog Frog.....	4-16
4.2.3 Florida Burrowing Owl.....	4-17

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page i

4.2.4	Bald Eagle	4-17
4.2.5	Santa Rosa Beach Mouse	4-18
4.2.6	Shorebirds.....	4-18
4.2.7	Red Knot.....	4-18
4.3	Effects Determinations	4-20
5.	CONCLUSION	5-1
6.	LIST OF PREPARERS	6-1
7.	REFERENCES	7-1

LIST OF TABLES

	<u>Page</u>
Table 2-1. INRMP Activities and Associated Component Plans	2-1
Table 2-2. Annual Prescribed Fire and Wildfire Numbers and Size.....	2-3
Table 2-3. Forest Management Activities.....	2-4
Table 2-4. Habitat Restoration Activities	2-4
Table 2-5. Nuisance and Non-native Animal Management Activities	2-5
Table 2-6. Ecological Monitoring Activities	2-6
Table 2-7. Protected Species Management and Monitoring	2-6
Table 2-8. Recreation Management Activities	2-8
Table 2-9. Recommended Timber Management Practices for the Flatwoods Salamander	2-12
Table 3-1. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers	3-7
Table 3-2. Sea Turtle Nesting Periods by Species for SRI, Eglin AFB.....	3-9
Table 3-3. Sea Turtle Nesting on SRI, Eglin AFB	3-10
Table 3-4. Average Sea Turtle Hatching Occurrences by Month for SRI, Eglin AFB.....	3-12
Table 3-5. Sea Turtle Nesting Periods for CSB, Eglin AFB.....	3-12
Table 3-6. Loggerhead Nesting on CSB, Eglin AFB.....	3-13
Table 3-7. Average Loggerhead Hatching Occurrences by Month at CSB, Eglin AFB.....	3-14
Table 4-1. No Suppression, Restricted Suppression, and Biologically Sensitive Areas.....	4-2
Table 4-2. Prescribed Fire Frequency and Active RCW Trees Within the No Suppression and Restricted Suppression Areas	4-4
Table 4-3. Effects Determinations for Eglin Mainland and SRI.....	4-21
Table 4-4. Effects Determinations for CSB.....	4-23

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page ii

LIST OF FIGURES

	<u>Page</u>
Figure 1-1. Location of Eglin AFB.....	1-2
Figure 2-1. Eglin Core Conservation Area.....	2-16
Figure 2-2. Limited Suppression Areas (NOTE: This is a data snapshot).....	2-17
Figure 2-3. RCW Hub Sand Pine Percentages.....	2-18
Figure 2-4. Priority Areas for Forest Restoration Timber Sales	2-19
Figure 3-1. Sensitive Species and Critical Habitat at Eglin Mainland (East)	3-2
Figure 3-2. Sensitive Species and Critical Habitat at Eglin Mainland (West).....	3-3
Figure 3-3. Sensitive Species and Critical Habitat at Santa Rosa Island	3-4
Figure 3-4. Sensitive Species and Critical Habitat at Cape San Blas	3-5
Figure 3-5. Eglin RCW Population Trends and Goals.....	3-6
Figure 3-6. Average Sea Turtle Nest Occurrences by Month (1989-2011) for SRI, Eglin AFB.....	3-11
Figure 4-1. Number of Red Knots Sighted at Cape San Blas	4-19
Figure 4-2. Sighting Locations of Red Knots at Cape San Blas	4-20

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

ac	Acre
AF	Air Force
AFB	Air Force Base
ATV	All-Terrain Vehicle
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	Best Management Practice
BO	Biological Opinion
CCA	Core Conservation Area
CP	Component Plan
CSB	Cape San Blas
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dbh	Diameter at Breast Height
DNA	Deoxyribonucleic Acid
EIAP	Environmental Impact Analysis Process
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FNAI	Florida Natural Areas Inventory
FTA	Florida Trail Association
FTE	Full-Time Equivalent
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information System
GOM	Gulf of Mexico
GPS	global positioning system
ha	Hectare
HCP	Habitat Conservation Plan
HQNA	High Quality Natural Area
INPS	Invasive Non-native Plant Species
INRMP	Integrated Natural Resources Management Plan
ITP	Incidental Take Permit
LVC	Long-term Vegetation Control
MEA	Management Emphasis Area
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NRS	Natural Resources Section
PAM	Public Access Map
PBG	Potential Breeding Group
psi	Pounds per Square Inch
RCW	Red-cockaded Woodpecker
ROI	Region of Influence
SAIA	Sikes Act Improvement Amendment
SRI	Santa Rosa Island
T&E	Threatened and Endangered
TSI	Timber Stand Improvement
U.S.	United States
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page iv

Introduction**1. INTRODUCTION**

This Biological Assessment (BA) is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This report addresses potential impacts to all federally listed threatened and endangered (T&E) species and other sensitive species associated with the implementation of the *Integrated Natural Resources Management Plan* (INRMP) at Eglin Air Force Base (AFB), Florida (Figure 1-1). This BA, conducted by Eglin's Natural Resources Section (NRS), is meant to initiate the formal consultation process with the United States Fish and Wildlife Service (USFWS) pursuant to Section 7 of the ESA. The objectives of this BA are to:

- Document all federally listed T&E species and associated habitat that occur, or may potentially occur, on Eglin AFB near the Proposed Action.
- Identify the activities that have the potential to impact, either beneficially or adversely, those documented species.
- Determine and quantify to the extent possible what effects these activities will most likely have on federally listed species.

As the largest forested military reservation in the United States, Eglin AFB supports a multitude of military testing and training operations, as well as many diverse species and habitats. The purpose of the Eglin INRMP is to provide interdisciplinary strategic guidance for the management of these natural resources in support of the military mission within the land and water ranges of the Eglin Military Complex, located in Santa Rosa, Okaloosa, Walton, and Gulf Counties in northwest Florida and the Gulf of Mexico. The Eglin INRMP integrates and prioritizes wildlife, fire, and forest management activities to protect and effectively manage the Complex's aquatic and terrestrial environments and ensure "no net loss" in the operational capability of these resources to support Eglin test and training missions.

Introduction

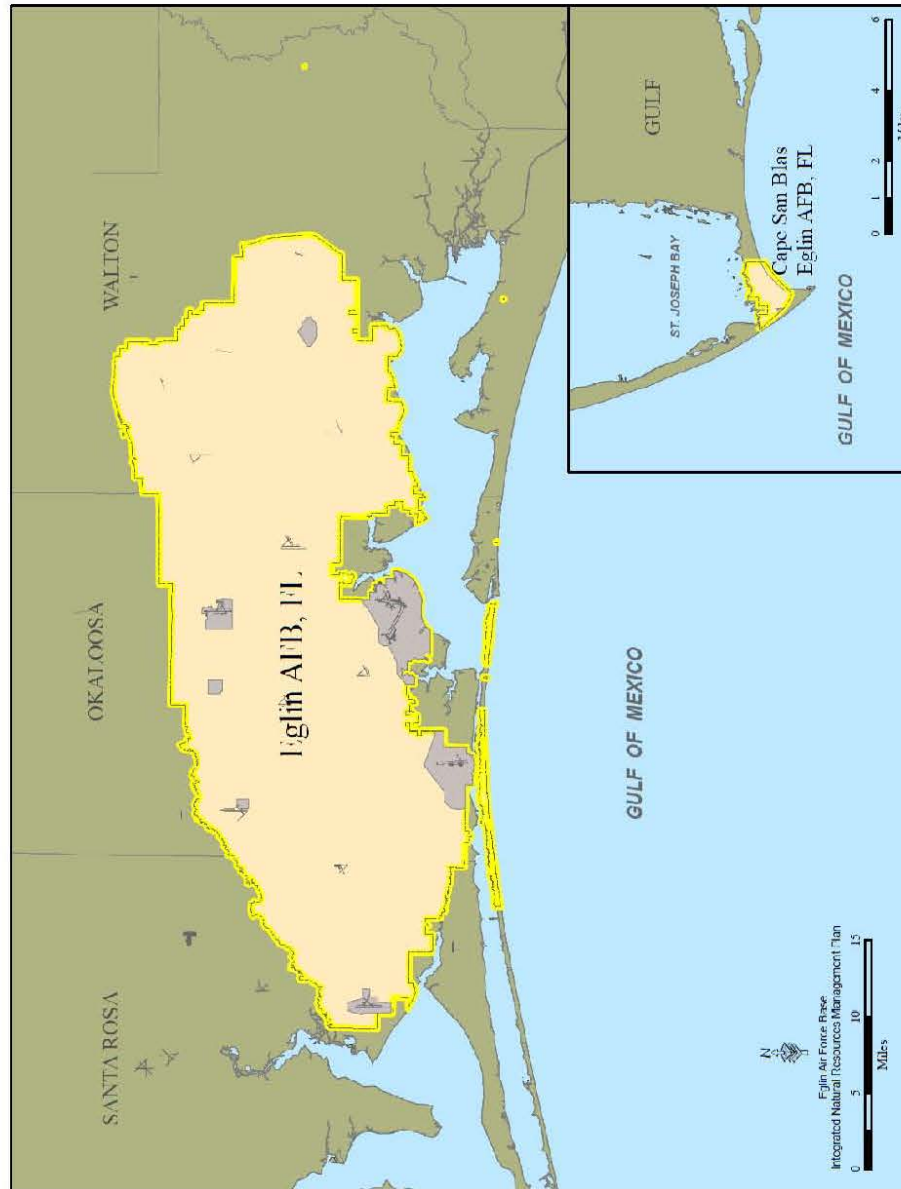


Figure 1-1. Location of Eglin AFB

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 1-2

Description of Proposed Action

Introduction

2. DESCRIPTION OF PROPOSED ACTION**2.1 INTRODUCTION**

In 1960, the Sikes Act (Public Law 86-797) mandated the use of military lands for wildlife conservation and public recreation, authorizing the general public to hunt and fish on military installations as long as these activities were consistent with the military mission. Although the Sikes Act required installations to prepare natural resources management plans, it did not require installations to implement them. In 1998, the National Defense Authorization Act was passed, which included the Sikes Act Improvement Amendments (SAIA). The SAIA required the installation commanders of each military installation in the United States to not only prepare INRMPs but implement them as well.

The Eglin NRS is currently updating its INRMP to guide the direction of natural resources management on Eglin's lands and within the waters beneath Eglin's over-water airspace from 2012 - 2016. The INRMP is a programmatic document that details planned natural resources management activities over the next 5 years, including wildlife, fire, and forest management; the implementation of these activities is the Proposed Action for this BA. Eglin AFB previously performed biological analysis of natural resources management activities during the INRMP Section 7 consultation in 2002 (U.S. Air Force, 2002; USFWS, 2002). The Proposed Action will involve a continuation of certain management activities and also implement changes in some activities to address issues identified during the INRMP review and planning process.

Due to the size and complexity of Eglin AFB and its INRMP, Component Plans (CPs) detailing the operational activities for each major NRS program were developed to support the main INRMP (Table 2-1). These CPs are part of the overall INRMP, included as appendices on CD, and should be used by reviewers and partners to find additional information on each program. CPs are considered "living" and are continually updated; therefore, they are never "finalized." Detailed information for each INRMP activity can be found in the corresponding CP(s) listed in Table 2-1.

Table 2-1. INRMP Activities and Associated Component Plans

INRMP Activity	Component Plans
Prescribed fire	-Wildland Fire Management Plan
Wildfire support	
Forest management	-Forest Management Component Plan
Habitat restoration	-Erosion Control Component Plan -Threatened and Endangered Species Component Plan
Nuisance and non-native animal management and BASH	-Invasive Non-native Wildlife, Feral Animals, and Nuisance Native Wildlife Operational Plan
Ecological monitoring	-Ecological Monitoring Component Plan
Protected species management and monitoring	-Threatened and Endangered Species Component Plan
Recreation management	-Outdoor Recreation Component Plan

BASH: Bird/Wildlife Aircraft Strike Hazard; INRMP: Integrated Natural Resources Management Plan

Description of Proposed Action**Introduction**

The region of influence (ROI) for this analysis is mainland Eglin, Santa Rosa Island (SRI), and Cape San Blas (CSB). Current land use within the ROI consists of military mission activities, natural and cultural resource management, and public use. The interstitial area of Eglin (areas outside of cantonment and test areas) is where the majority of natural resources management activities occur.

2.2 OVERVIEW OF MANAGEMENT ACTIVITIES

The Proposed Action refocuses the NRS program according to the five principal goals from the 2012-2016 INRMP:

- Provide direct support and coordination services by planning for and adapting to a rapidly changing military mission.
- Restore the longleaf pine ecosystem and recover threatened and endangered species in the Core Conservation Area (CCA) (Figure 2-1).
- Enable long-term sustainability of barrier island environments for military testing/training by protecting and maintaining threatened and endangered species and their habitats.
- Restore, protect, and monitor wetland and aquatic habitats to comply with federal law and recover threatened and endangered species.
- Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.

Below is a description of the Proposed Action for each NRS program component.

2.2.1 Prescribed Fire

Eglin maintains an annual prescribed fire goal of at least 90,000 acres based on a five-year average (Table 2-2) to support its globally significant, fire dependent ecosystems. Aerial ignition is used preferentially whenever possible because it improves smoke management by allowing early completion of burns and better smoke dispersion. NRS uses all-terrain vehicle (ATV) mounted, pickup-mounted and hand-held torches as needed to assist and supplement aerial ignition. A geographic information system- (GIS-) based management prioritization system synthesizes multiple data layers including fire history, ecosystem health information (based on remote sensing and ground surveys), mission requirements, presence of rare, fire-dependent species, management objectives, smoke management constraints, and forest management activities. The output is a prioritized landscape management map that guides day-to-day activities on the ground, as well as short-term and long range planning efforts. Heightened concern over unexploded ordnance (UXO) has recently increased restrictions on fire activities within high probability areas for UXO (restricted suppression areas), limiting access to these areas during active fire (Figure 2-2). NRS will also increase night-time prescribed burning to meet acreage goals for habitat restoration.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-2

Description of Proposed Action

Overview of Management Activities

Table 2-2. Annual Prescribed Fire and Wildfire Numbers and Size

Prescribed Fires	
Average acres annually	90,000
Average annual number	125
Average size (acres)	720
Night burns (#)	10
Helicopter use	Exclusive use of helicopter
Wildfires	
Average acres annually	17,000
Average annual number	154
Average size (acres)	60
Additional wildfire acres within no and restricted suppression areas	8,000
No Suppression and Restricted Suppression Areas	
No suppression and restricted suppression areas	<ul style="list-style-type: none"> • 40,000 acres of no and restricted suppression areas • No monitors of RCW trees allowed until after fire complete. • No plowing in UXO areas.

RCW = red-cockaded woodpecker.

Baseline for number of wildfires was average for 2006-2010, plus an estimated 40 percent increase due to BRAC missions (U.S. Air Force, 2012). Proposed Action assumes 20 percent increase in size of wildfires within the no and restricted suppression areas only.

2.2.2 Wildfire Support

Wildfire support includes all aspects of fire prevention, detection, suppression, readiness, fire line rehabilitation, and training. Both wildfire occurrence and associated risk are high for Eglin (Table 2-2). As populations increase around Eglin's borders, risks of negative impacts to the public from wildfires and their smoke also increases. Air Force structures and equipment are also at risk from wildfire damage, and smoke can negatively impact visibility-sensitive missions. Wildfire suppression typically involves the use of heavy equipment (dozers) to plow fire lines or drip torches to burn out areas in advance of the fire to contain it. Crews may also clear debris from existing roads and firebreaks or use water tankers to control the fire within a burn block. An increase in fire-starting missions is anticipated to increase wildfire activity in upcoming years. Additionally, increased restrictions on fire activities within high probability areas for UXO (restricted suppression areas) limits access to these areas during active fire and effectively increases the size of wildfires within these areas (Figure 2-2).

2.2.3 Forest Management

Forest management supports sustainable forest management practices and protected species habitat restoration (Table 2-3). Forest Management conducts timber removal, site preparation, reforestation, and native understory restoration activities to promote endangered species recovery and biodiversity (Figure 2-3 and Figure 2-4). Activities conducted by Forest Management include removal of sand pine that has invaded longleaf pine sandhills, conversion off-site slash pine and sand pine plantations to longleaf pine, salvage of damaged timber, and timber removal for construction. Reforestation activities include promoting natural regeneration of longleaf pine, planting longleaf pine seedlings, and using chemical and mechanical methods for habitat/timber stand improvement (TSI) and site preparation. Eglin's Forest Management also harvests and plants native grass seed for groundcover restoration and erosion site stabilization.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-3

Description of Proposed Action

Overview of Management Activities

Eglin follows the *Silviculture Best Management Practices* to minimize impacts to the environment resulting from forest restoration activities (FDACS, 2011).

Table 2-3. Forest Management Activities

Timber Management/Restoration (acres/year)	
Invasive sand pine removal	3,000
Sand pine plantation removal	500
Stunted slash pine plantation removal	800
Slash pine plantation thinning/conversion	325
Longleaf pine thinning	3,000
Sand pine seed tree	500
Timber Stand Improvement (acres/year)	
Sand pine removal TSI (brushsaw/chainsaw)	6,000
Herbicide (chemical) TSI	1,000
Reforestation (acres/year)	
Site preparation	2,500
Planting and natural regeneration	4,000 (planting and natural regeneration)

TSI: timber stand improvement

2.2.4 Habitat Restoration

For the purposes of this BA, habitat restoration will include erosion control, fish passage restoration, and invasive non-native plant species control activities; prescribed fire and forest management are discussed separately. Erosion control and fish passage restoration projects are focused in watersheds of the federally listed Okaloosa darter and Gulf sturgeon and those with potential Clean Water Act issues (Table 2-4). Erosion control projects focus mainly on the rehabilitation of borrow pits, dirt roads, and other erosion sites within riparian areas through culvert removal, earth moving, berm construction, and revegetation. Fish passage projects involve removal of culverts, floodplain reestablishment, and vegetation planting. Site maintenance continues on all erosion sites until they are stabilized.

Table 2-4. Habitat Restoration Activities

Erosion Control and Fish Passage Restoration	
T&E species erosion control sites	20 sites between 2012 and 2014
Fish passage restoration (#/5 years)	2
CWA erosion control sites (#/year)	5
Maintain all rehabilitated erosion sites for 3-5 years (#/year)	110
Invasive Non-native Plant Species	
INPS surveys	Annual FNAI surveys
INPS treatment	Annually treat 90% of sites located during previous years' surveys in HQNAs within 1 mile of urban interface

CWA: Clean Water Act; FNAI: Florida Natural Areas Inventory; HQNA: High Quality Natural Area; INPS: Invasive Non-native Plant Species; T&E: Threatened and Endangered

Invasive non-native plant species (INPS) control involves identifying problem areas, mapping locations, and applying control techniques, including but not limited to herbicide treatment, mowing, disking, hand pulling, and prescribed fire (Table 2-4). Efforts focus on areas with

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-4

Description of Proposed Action**Overview of Management Activities**

sensitive species and habitats, with the majority of problem areas located along the urban interface.

2.2.5 Nuisance and Non-native Animal Management

Non-native animal control efforts center on feral hogs on the mainland reservation and feral cats, coyotes, and red foxes on SRI and CSB (Table 2-5). Sensitive areas where hog damage has been found are prioritized for hog trapping. The NRS sponsors the U.S. Department of Agriculture (USDA) to control non-native predators and unnaturally high densities of native predators on SRI and CSB, which reduces impacts to sea turtles, shorebirds, beach mice, and other sensitive beach species.

Eglin NRS is the lead agency responsible for responding to nuisance and injured wildlife through the following options: 1) not intervening, 2) capturing and immobilizing, 3) taking to the Emerald Coast Wildlife Refuge or a local vet for treatment or rehabilitation, or 4) euthanizing.

The NRS will continue to provide bird/wildlife aircraft safety hazard (BASH) support and assistance to USDA personnel for bird and wildlife harassment, lethal control activities, and other projects such as vulture roost monitoring, effigy placement, and migratory bird nest removal activities.

Table 2-5. Nuisance and Non-native Animal Management Activities

Feral hogs	<ul style="list-style-type: none"> Hog surveys in flatwoods salamander ponds, steepheads, and seepage slopes Hog control as needed in sensitive habitats
SRI predator control	Biannual predator track counts and follow-up control efforts by USDA
Cape San Blas	Trap on an as-needed basis
Fire ants	Hot water treatments in flatwoods salamander ponds
Nuisance animal responses	As needed
BASH responses	USDA manages

BASH: bird/wildlife aircraft strike hazard; USDA: U.S. Department of Agriculture

2.2.6 Ecological Monitoring

The mission of the Ecological Monitoring Program is to enhance military mission flexibility and success by supporting the Eglin NRS adaptive management efforts through statistically sound, scientifically based monitoring of community conservation targets, including sandhills, flatwoods, steepheads, seepage slopes, and stream habitats (Table 2-6). Ecological monitoring supports adaptive management by informing managers of community change resulting from management actions. If impacts are negative (e.g., loss or degradation of ecosystem function and processes), management practices can be altered. Alternatively, management actions that prove to have ecologically beneficial outcomes can be perpetuated. This iterative feedback loop, whereby monitoring can inform and affect management, is referred to as “adaptive management.” Remote sensing and spatial modeling tools are used as a component of this program.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-5

Description of Proposed Action

Overview of Management Activities

Table 2-6. Ecological Monitoring Activities

Longleaf pine sandhills and flatwoods	200 1-hectare plots sampled one growing season after management activity, or at least every 5 years
Seepage slopes	28 slopes monitored on 4-year cycle
Steephead streams	32 steepheads monitored on 4-year cycle
Biological, chemical, and physical stream surveys	<ul style="list-style-type: none"> Annual assessments in tributaries to Yellow and Shoal Rivers Before and after restoration sampling (6 months, 1 year, 5 years) at 10 sites

2.2.7 Protected Species Management and Monitoring

To protect and recover T&E species, the NRS conducts a variety of both species-specific and general habitat management and monitoring activities (Table 2-7). Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management activities that benefit T&E species are covered in those respective sections. Species-specific activities in this section include population monitoring, hardwood control in flatwoods salamander habitat, and translocation/relocation of species.

Under the ESA and Marine Mammal Protection Act (MMPA), Eglin must consult with the USFWS and/or the National Marine Fisheries Service (NMFS) on proposed actions that may affect federally listed T&E species or marine mammals, respectively. Within the Air Force, this initial determination is made as part of the Environmental Impact Analysis Process (EIAP) review, which involves many Eglin organizations, including the NRS, as active team members. The role of the NRS in the EIAP is to assess potential impacts of proposed mission activities to natural resources and determine measures to avoid or minimize impacts. As part of this process, the NRS may need to do a Section 7 consultation, MMPA consultation, and/or Coastal Zone Management Act (CZMA) determination.

Protected species management and monitoring efforts are focused on the 11 federally listed and select state-listed species present on the Eglin Reservation (Table 2-7) and is expanding to include the four freshwater mussel species soon to be federally listed. To protect migratory bird species, Eglin NRS will continue with surveys and impact minimization measures for military activities. The NRS will also continue to support the military mission by improving Eglin's process for tracking implementation of natural resources requirements.

Table 2-7. Protected Species Management and Monitoring

Mainland Eglin	
RCW	<ul style="list-style-type: none"> Focused on CCA and 450 MEA, particularly on the east side Annually conduct tree checks on all active cluster and inactive recruitment clusters; conduct group check on 25% of active clusters annually Cavity inserts Translocation Prescribed fire, forest management, ecological monitoring*
Reticulated flatwoods salamander	<ul style="list-style-type: none"> 100% annual dip net sampling of known ponds (20 ponds as of 2012) Years when known sites occupied, resample 20-50 percent of potential ponds Mid-story hardwood control Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management*

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-6

Description of Proposed Action

Overview of Management Activities

Table 2-7. Protected Species Management and Monitoring (cont'd)

Okaloosa darter	<ul style="list-style-type: none"> Visual surveys within a 20-meter reach at each of 28 sites Ecological monitoring, habitat restoration, and nuisance and non-native species management*
Gulf sturgeon	<ul style="list-style-type: none"> Summer tracking in rivers and bays Winter tracking in Gulf, bays Habitat restoration*
Indigo snake	<ul style="list-style-type: none"> Pre-land disturbing project surveys and relocation if found Prescribed fire*
Freshwater mussels	<ul style="list-style-type: none"> Annual surveys in rivers adjacent to Eglin Habitat restoration*
Gopher tortoise	<ul style="list-style-type: none"> Annually monitor status of 20% of known tortoise burrows from previous surveys Low intensity monitoring program Pre-land disturbing project surveys and relocation Maintain relocation sites Prescribed fire *
Bald eagle	<ul style="list-style-type: none"> Weekly survey during nesting season at nests accessible by foot Post primary zone (330 feet) around bald eagle nests during the nesting season.
Florida burrowing owl	<ul style="list-style-type: none"> Monthly surveys during breeding season Maintain T perches Trims vegetation around burrows where necessary Prescribed fire *
Florida black bear	<ul style="list-style-type: none"> Assistance with nuisance bear complaints Maintain sightings/mortalities database
Florida bog frog	<ul style="list-style-type: none"> 100% annual resurvey of known bog frog locations with three visits to each site Annually resample a portion of sites in close proximity to known sites where bog frogs have not been found Prescribed fire, habitat restoration, and nuisance and non-native species management*
Santa Rosa Island and Cape San Blas	
Sea turtles	<ul style="list-style-type: none"> Daily monitoring May 1 to Oct 31 Mark and place protective screening over all nests at SRI Nuisance and non-native species management*
<i>Cladonia</i>	<ul style="list-style-type: none"> Population estimate every 5 years; more often if major storm event Maintain fencing and posting at 4 sites Habitat restoration*
Piping plover	<ul style="list-style-type: none"> Surveys every 2 weeks from July to May at half mile intervals on south side of SRI, and appropriate habitat on north side Maintain posting at habitat areas on SRI Establish closed area posting on north side of SRI
Santa Rosa beach mouse	<ul style="list-style-type: none"> Conduct one sand track count survey every quarter, and conduct tracking tube surveys once every 6 months at 10 predetermined transects Nuisance and non-native species management*
Shorebirds	<ul style="list-style-type: none"> Survey every 2 weeks year-round at SRI Monthly survey at CSB Weekly nesting surveys from March to July Mark nests potentially impacted by the public or mission activities Nuisance and non-native species management*

CCA: Core Conservation Area; CSB: Cape San Blas; MEA: Management Emphasis Area; RCW: red-cockaded woodpecker; SRI: Santa Rosa Island. *Prescribed fire, forest management, ecological monitoring, habitat restoration, and nuisance and non-native species management activities that benefit T&E species are covered in those respective sections.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-7

Description of Proposed Action

Overview of Management Activities

2.2.8 Recreation Management

The NRS strives to promote and develop sustainable recreational opportunities, which include hunting, fishing, trapping and non-consumptive uses in a manner compatible with the military mission and subject to safety and security requirements. The state of Florida owns and has jurisdiction over resident fish and wildlife throughout the state, including Eglin AFB. As such, the Florida Fish and Wildlife Conservation Commission (FWC) establishes rules, regulations, and season dates governing the taking of resident fish and wildlife species. Non-consumptive recreation includes canoeing, hiking, picnicking, nature study and appreciation, swimming, and bicycling (Table 2-8). Due to inadequate conservation law enforcement, some of Eglin's natural resources are becoming degraded as a result of noncompliance with applicable laws and Eglin specific rules and regulations.

Table 2-8. Recreation Management Activities

Hunting and Fishing	
Available hunting acres	248,321
Quail management emphasis area	Herbicide treatment for 100 acres annually
Timberlake dove fields	Reestablish longleaf pine on portions of Timberlake dove fields and buffer
Fishing	29 ponds, 252 acres, four ponds stocked with grass carp for weed control
Annual youth fishing rodeo	One annually, 200 youth participants
High-intensity pond management	Maintain high intensity management of Indigo and Duck ponds; establish Anderson Pond as high intensity by 2013
Low-intensity pond management	15 ponds
Recreational impoundment spillway structure renovation	One annually
Non-consumptive Recreation	
Camp sites and day use areas	Manage 20 primitive camp sites and nine day use areas
Florida Scenic Trail	FTA is responsible for trail maintenance; 8 campsites; FTA to finish last of trail on Eglin; 70 miles of trail
Timberlake bike trail system	26 miles of trails
Beach access	Official beach access points/ 4 miles public beach @ SRI and 3 miles @ CSB; CSB allows beach driving on non-interference basis—no nighttime driving allowed from May 1 to Oct 31; beaches are closed to activities from sunset to sunrise
Canoeing	Trims low branches on Turkey, Rocky, Alaqua, and Boiling Creeks
Horseback riding	Open access areas on established tertiary roads

CSB: Cape San Blas; FTA: Florida Trail Association; SRI: Santa Rosa Island

2.2.9 Conservation Measures

To minimize impacts to federally listed species from INRMP activities, the NRS will include the following conservation measures as part of its INRMP implementation. These measures are a combination of terms and conditions and conservation measures from previous Section 7 consultations, along with new conservation measures added during the 2012-2016 INRMP update.

General

- Brief NRS personnel and contractors on requirements resulting from the INRMP Section 7 Consultation and any other applicable consultations.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-8

Description of Proposed Action**Overview of Management Activities**

- Brief mission and construction personnel on requirements from Section 7 consultations that are applicable to their activities, and conduct spot checks for compliance, as resources allow.

RCW

- Do not conduct potentially disturbing management activities (i.e., forest management) within active red-cockaded woodpecker (RCW) clusters during the RCW nesting season.
- Conduct forestry as well as other activities within RCW foraging habitat in accordance with the most current RCW Recovery Plan tree density requirements.
- Hire four additional firefighter positions.
- Continue to actively protect active cavity trees during a wildfire. This protocol is detailed in the WFMP.
- Prior to prescribed burns, prepare active cavity trees and newly drilled artificial cavity trees in recruitment clusters by cutting fuels around the individual cavity trees out to a distance of approximately 5 meters using a Brown tree cutter, Positrack mower, or D.R. mower mounted behind an ATV, and then raking the clippings away from the trees with rakes.
- Post a RCW trained monitor on all prescribed burns that involve active clusters or recruitment clusters, except those within UXO restricted suppression areas.
- For nighttime burns, prepare RCW cavity trees prior to fire and have trained RCW monitors present during the fire.
- For prescribed burns within no and restricted suppression areas:
 - When deemed necessary, extend pre-fire preparation out further from the tree or apply fire-resistant foam or water on or around the tree prior to fire being set.
 - Check all cavity trees immediately following the fire to assess damage and to determine the need for replacement cavities.
- Eglin NRS would replace any cavity tree damaged by fire to the point it is unsuitable for nesting or roosting within 72 hours with a box insert. Roost checks would not be conducted since it would be uncertain as to which bird would have been using the tree. Eglin NRS would conduct a roost check and visually inspect the cavity if, during a night burn, the fire burned up through the cavity.
- Annually burn no suppression areas at and around test areas A-77, A-78, A-79, B-7, and C-62.
- Follow requirements in the Long-term Vegetation Control (LVC) BA and consultation regarding hexazinone application on interstitial areas consultation (U.S. Air Force, 2007a; U.S. Air Force, 2001), including:
 - All herbicide applicators used will be certified Florida herbicide applicators. New contracts will require herbicide applicators to be certified in the Florida Natural Areas Category.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-9

Description of Proposed Action**Overview of Management Activities**

- Adhere to herbicide labels and instructions during handling, mixing, and application of all herbicides.
- Digitize sensitive habitat locations using global positioning system (GPS)/GIS, and provide files to herbicide applicators to avoid the areas, unless application in such areas is specifically approved by the NRS.
- Applicators must coordinate with an Eglin NRS endangered species biologist prior to applying herbicides in sensitive areas.
- Brief all contractors and their staff on any potential endangered species concerns before conducting herbicide application activities in endangered species habitat.
- During RCW nesting season (April to July), any treatments occurring within the boundaries of active RCW clusters must be by hand crew application methods only.

Sea Turtles at SRI

- Post the exclusion areas and official beach access points on the public use portion of SRI, including information on the hours that beaches are closed to activities (sunset to sunrise).
- Follow Florida Department of Environmental Protection (FDEP) guidelines for any necessary dune restoration or protection projects.
- Continue to participate in and implement predator control to ensure predation of sea turtles and nests is maintained at a rate of less than 5 percent.
- Ensure that Eglin facilities with lighting visible from the Gulf use sea turtle friendly lighting during sea turtle season.
- Work with Okaloosa County Sheriff's Office to ensure patrols of the public access portion of Eglin SRI property; provide information to their officers regarding sensitive areas and appropriate methods for driving on the beach
- Ensure that no daytime beach driving by Okaloosa County Sheriffs, Eglin Range Patrol, or Eglin Natural Resources personnel occurs on the Gulf beachfront before completion of daily sea turtle nest survey and protection measures from May 1 to October 31.
- For driving on the beach at SRI:
 - Vehicles must have tire pressures equal to or less than 10 pounds per square inch (psi), if feasible.
 - Be cognizant of the potential effects of human presence and vehicles on sea turtles and behave accordingly.
 - Operate vehicles at speeds less than 10 miles per hour (except in emergency situations).
 - No driving on or across the dunes.
 - Drive vehicles seaward of the wrack or debris line (previous high tide) or just above it during high tide conditions.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-10

Description of Proposed Action**Overview of Management Activities**

- Cover headlights with the appropriate sea turtle filter material; if not feasible, vehicle headlights should be used at night only when the vehicle is moving.
- Use sea turtle compatible hand-held lights.
- If a sea turtle is sighted on the beach, the following measures are implemented:
 - Any vehicles are turned off, headlights switched to parking lights, and personnel remain stationary until the turtle enters the sea.
 - If a turtle appears to be in trouble, the appropriate NRS designee is contacted for instructions to proceed.
 - If a turtle crawl is seen on the beach during daytime or nighttime hours with no associated marked nest, the appropriate NRS designee is immediately notified, and the nest and crawl are left undisturbed.
- If vehicles are used by Okaloosa County sheriffs, Eglin Range Patrol, or Eglin Natural Resources personnel that have tire pressures greater than 10 psi, institute tire track/rut removal during the nest hatching period, to include the following:
 - Remove all ruts seaward of nests expected to hatch within 10 days before sunset each day or until 3 days after first signs of hatchling emergence or the nest has been washed out or destroyed, whichever is earlier.
 - Implement rut removal if the following criteria are met: 1) one or more ruts occur within a 20-foot-wide path between the nest and the Gulf, 2) at least one of these ruts is greater than 1 inch deep; 3) any ruts deeper than 1 inch are at least 3 feet in length; and 4) ruts deeper than 1 inch are oriented in any other direction than perpendicular to the Gulf of Mexico.
 - Perform rut removal in the late afternoon before sunset.
- Continue daily early morning (between sunrise and 9 a.m.) sea turtle nest surveys and marking from May 1 through October 31 in accordance with FWC permit requirements.
- Continue to participate in Florida's Sea Turtle Stranding and Salvage Network.
- Notify personnel involved in any aspect of enforcement or management of nonconsumptive recreational use on the public beach on Eglin that, upon locating a sea turtle adult, hatchling, or egg that has been harmed or destroyed, contact must be made with the NRS immediately and that care should be taken in handling injured turtles or eggs.

Sea Turtles at CSB

- All requirements for SRI also apply to CSB beaches.
- Additional requirements from lease agreement between U.S. Air Force and Gulf County include:
 - The Habitat Conservation Plan (HCP) has been submitted to the USFWS and is currently (calendar year 2012) being reviewed by the Atlanta Regional Office. When the HCP is approved by the USFWS, the licensee will be

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-11

Description of Proposed Action

Overview of Management Activities

required to implement all requirements of the HCP, including enforcement of the provisions and conditions of the HCP.

- Licensee will obtain an Incidental Take Permit (ITP) from the USFWS. Licensee will also implement all requirements of the ITP, including the enforcement of the provisions and conditions of the ITP.
- Until the HCP is approved and the ITP is obtained, licensee will implement the same rules on the Air Force beaches as are implemented on the St. Joseph Bay Aquatic Preserve beaches to include but not limited to:
 - Prohibiting driving on Air Force beaches from sunset until 9 a.m. from 1 May to 1 November and enforcing such prohibition.
 - Prohibiting beach driving where Air Force property and aquatic preserve boundaries overlap and enforcing such prohibition.
 - Posting beach signs and removing ruts caused by beach driving.

Reticulated Flatwoods Salamander

- To minimize the potential for wildfires, NRS will maintain a 3-year burn rotation in the East Bay Flatwoods area.
- NRS will apply the USFWS *Recommended Timber Management Practices for the Flatwoods Salamander* (USFWS, 1999) (Table 2-9).
 - Use prescribed burning as the preferred method for site preparation and control of woody vegetation. Limit herbicide use to manual application according to BMPs only when fire cannot be used.
 - Avoid tying fire lines into known breeding ponds and other seasonal ponds, and avoid plowing around these ponds.
 - During prescribed burning or firefighting operations, avoid using foam or water from tanks containing foam residue in or around seasonal ponds.

Table 2-9. Recommended Timber Management Practices for the Flatwoods Salamander

Primary Zone	Secondary Zone
538 feet from pond edge	538 to 1,476 feet from pond edge.
Selective harvest only	Mix of clear-cutting and selective harvest; clear-cut up to 25 percent at any given time, maintain 75 percent of flatwoods habitat.
Harvest only during dry periods.	
Harvest at a minimum of 10-year intervals.	
Maintain basal area at 45-50 square feet per acre.	
Primary and secondary zones should not be separated by cleared or non-pine flatwoods habitat.	
Locate skid trails so that wetland hydrology is not altered.	
Locate log landings outside the primary and secondary zones.	
Do not conduct intensive mechanical site preparation (root-raking, discing, stumping, bedding).	

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-12

Description of Proposed Action

Overview of Management Activities

- Follow the *Silvicultural BMPs for Florida* (FDACS, 2011) during forest management activities.
- For necessary firebreaks along the urban interface within wetland areas, NRS will follow requirements from the *Gyrotrack Section 7 Consultation* (U.S. Air Force, 2003), including:
 - Use a low ground pressure Positrack tracked vehicle for mowing.
 - Conduct work during dry periods.
- Fire crews will be briefed on protection of flatwoods salamander habitat prior to and during the fire season.
- For fire suppression activities within known and potential salamander habitat:
 - Plows will not be used off of range roads for fire suppression except in extreme conditions.
 - Fire crews will avoid plowing for suppression unless absolutely necessary; block and burn methods are preferable.
 - If fire plows or foam are used during extreme conditions, a letter of action will be completed and sent to the USFWS. The letter will contain a detailed description of actions taken during the activity, any potential impacts to the species or its habitat, and all action taken to rehabilitate the site.
- As problem areas for off-road driving are identified, the NRS will implement restricted access controls in flatwoods salamander habitats.
- During herbicide use, follow requirements in the LVC BA (U.S. Air Force, 2007a), including:
 - Herbicide applications for all non-aquatic labeled herbicides would not occur within 1,500 feet of confirmed and potential flatwoods salamander ponds.
 - Restrict aerial application of non-aquatic label pesticides near aquatic sensitive habitats.
- Per the *Hardwood Thinning BA* (USFWS, 2008), for hardwood control in flatwoods salamander ponds:
 - Apply herbicide with a sprayer to stumps using a U.S. Environmental Protection Agency (EPA) and FL Dept of Agriculture and Consumer Services approved herbicide for aquatic environments (e.g., Garlon 3A) immediately after cutting the plants. Apply in accordance with label instructions. Follow LVC BA.
 - Any refueling or lubricating of equipment shall be done at least 150 feet from the edge of the water in the pond
 - Cut plants will either be scattered in the uplands adjacent to the wetland in piles up to 5 feet above ground level, or scattered throughout the wetland, avoiding piles
 - All work must be completed outside of breeding season (October to December).

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-13

Description of Proposed Action

Overview of Management Activities

Okaloosa Darter

- For fire suppression activities within 100 feet of Okaloosa darter streams:
 - Plows will not be used off of range roads for fire suppression except in extreme fire danger as indicated by the Specific Action Guide.
 - Fire crews will avoid plowing for suppression unless absolutely necessary; block and burn methods are preferable.
- If necessary during emergency wildfire situations, a letter of action will be completed and sent to the USFWS. The letter will contain a detailed description of actions taken during the activity, any potential impacts to the species or its habitat, and all action taken to rehabilitate the site.
- Follow the *Silvicultural BMPs for Florida* (FDACS, 2011) during forest management activities.
- Employ BMPs during erosion control habitat restoration projects.
- Maintain vegetative buffer strips along riparian areas near supplemental food plots.
- Address any issues with off-road driving in Okaloosa darter streams with access controls.
- If the Youth Fishing Rodeo is moved to Anderson Pond, NRS personnel would be present at the rodeo to keep participants out of sensitive areas.
- During herbicide use, follow requirements in the LVC BA (U.S. Air Force, 2007a), including:
 - Herbicide applications for all non-aquatic labeled herbicides would not occur within 300 feet of Okaloosa darter streams.
 - Restrict aerial application of non-aquatic label pesticides near aquatic sensitive habitats.

Eastern Indigo Snake

- Eglin will continue to follow requirements from the *Eastern Indigo Snake Programmatic Biological Opinion (BO)* (USFWS, 2009), including:
 - Provide educational materials to contractors and personnel including a description of the snake, instructions not to harm or harass the snake, directions to stop activity and allow any sighted indigo snakes to move to safety, and contacts should an indigo snake be seen.
 - If an indigo snake is sighted, map the location in GIS and consider the surrounding 2,500 acres as habitat. If it is necessary to relocate an indigo snake, then use the Indigo Snake Habitat Suitability and Relocation Models to determine the most appropriate location to release the snake. Submit an indigo snake monitoring report to Panama City Field Office within 60 days of conclusion of clearing phases if indigo snake is sighted or relocated.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-14

Description of Proposed Action**Overview of Management Activities**

- Only those authorized by a Section 10(a)(1)(A) permit and designated as an agent by the FWC for such activities will be permitted come into contact with or relocate an indigo snake. Snakes would only be held in captivity long enough to transport them to a release site, and only one snake to a container during transport. Any dead specimens will be thoroughly soaked in water and frozen, then reported to the USFWS.
- Follow requirements in the LVC BA for herbicide use.

Gulf Sturgeon

- Follow the *Silvicultural BMPs for Florida* during forest management activities.
- Employ BMPs during erosion control habitat restoration projects.
- During herbicide use, follow requirements in the LVC BA (U.S. Air Force, 2007a), including:
 - Herbicide applications for all non-aquatic labeled herbicides would not occur within 300 feet of Gulf sturgeon critical habitat.
 - Restrict aerial application of non-aquatic label pesticides near aquatic sensitive habitats.

Piping Plover

- Post plover critical habitat.

Cladonia

- Post and fence habitat and official public beach access points.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-15

Description of Proposed Action

Overview of Management Activities

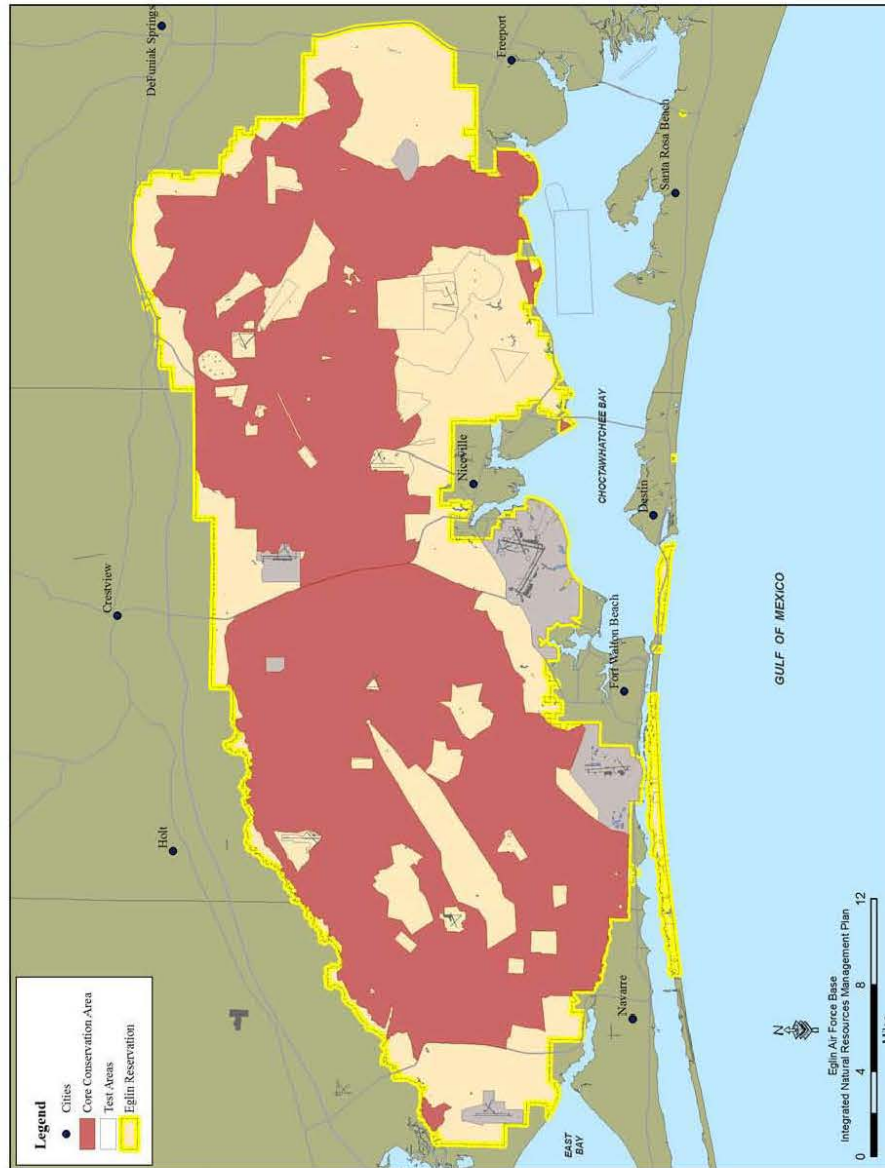


Figure 2-1. Eglin Core Conservation Area

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-16

Description of Proposed Action

Overview of Management Activities

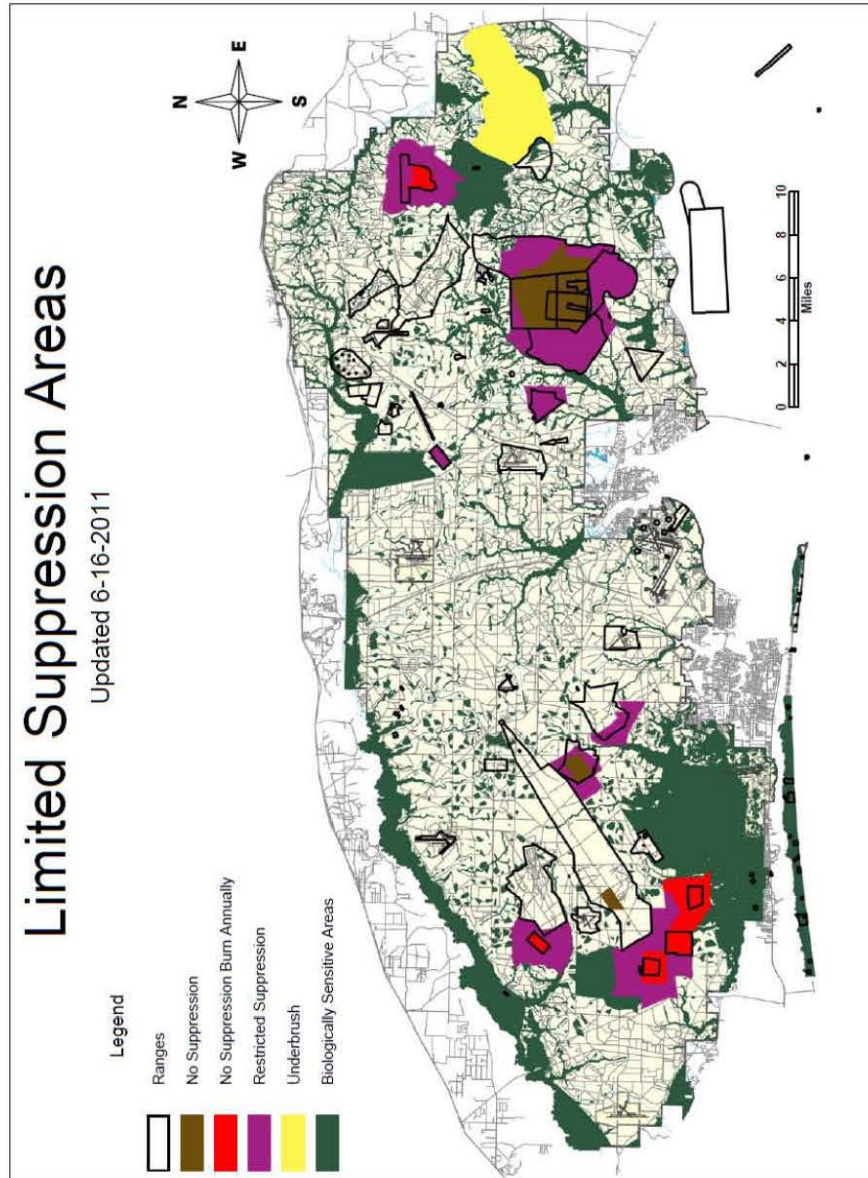


Figure 2-2. Limited Suppression Areas (NOTE: This is a data snapshot)

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-17

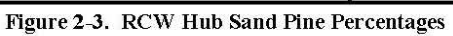


Figure 2-3. RCW Hub Sand Pine Percentages

Page 2-18

INRMP Activities at Eglin Air Force Base, Florida

Description of Proposed Action

Overview of Management Activities

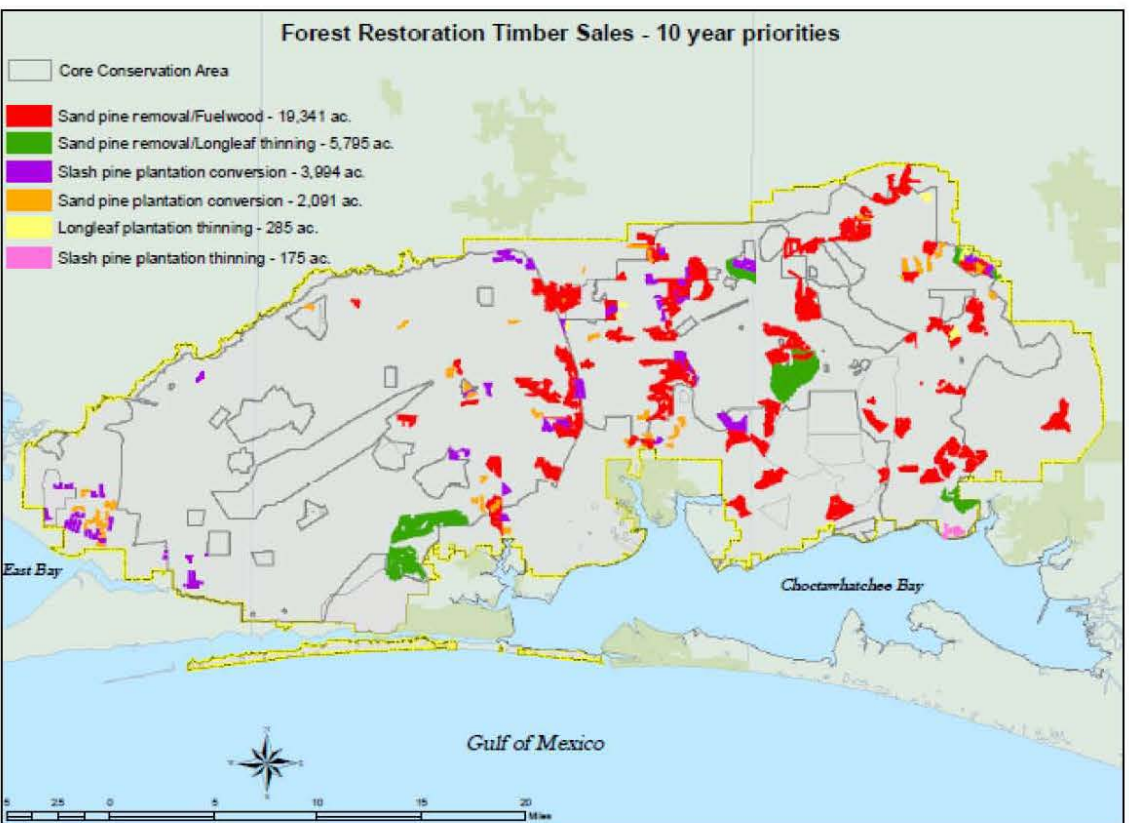


Figure 2-4. Priority Areas for Forest Restoration Timber Sales

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-19

Description of Proposed Action

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04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 2-20

Biological Information

Federally Listed Species

3. BIOLOGICAL INFORMATION

Eleven federally listed threatened and endangered species occur on Eglin AFB; multiple state listed species also occur on the base (Figure 3-1 to Figure 3-4). The following federally listed species were considered for this action:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Atlantic loggerhead sea turtle	<i>Caretta caretta</i>	Threatened
Atlantic green sea turtle	<i>Chelonia mydas</i>	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered
Reticulated flatwoods salamander	<i>Ambystoma bishopi</i>	Endangered
Okaloosa darter	<i>Etheostoma okaloosae</i>	Threatened
Eastern indigo snake	<i>Drymarchon couperi</i>	Threatened
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	Threatened
Piping plover	<i>Charadrius melodus</i>	Threatened
Florida perforate lichen	<i>Cladonia perforata</i>	Endangered

The following species are also included: gopher tortoise, southern sandshell, narrow pigtoe, Florida bog frog, Florida burrowing owl, bald eagle, Santa Rosa beach mouse, and shorebirds.

3.1 FEDERALLY LISTED SPECIES**3.1.1 Red-cockaded Woodpecker**

The RCW (*Picoides borealis*) is listed as a state and federal endangered bird species. The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. Due to the preservation of continuous longleaf pine forests on Eglin, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin AFB as 1 of 13 primary core populations for the RCW (U.S. Air Force, 2006).

In 2009, the RCW population on Eglin reached the designated recovery goal of 350 Potential Breeding Groups (PBGs) and reconsultation was completed for future management of the species. As of 2011, the population size was 443 active clusters and 401 PBGs (Figure 3-5). In addition to the goal of 350 PBGs, NRS personnel have developed a long-term goal of 450 PBGs in order to allow for more mission flexibility. The CCA includes the area required to reach the long-term population goal of 450 PBGs (Figure 2-1).

Biological Information

Federally Listed Species

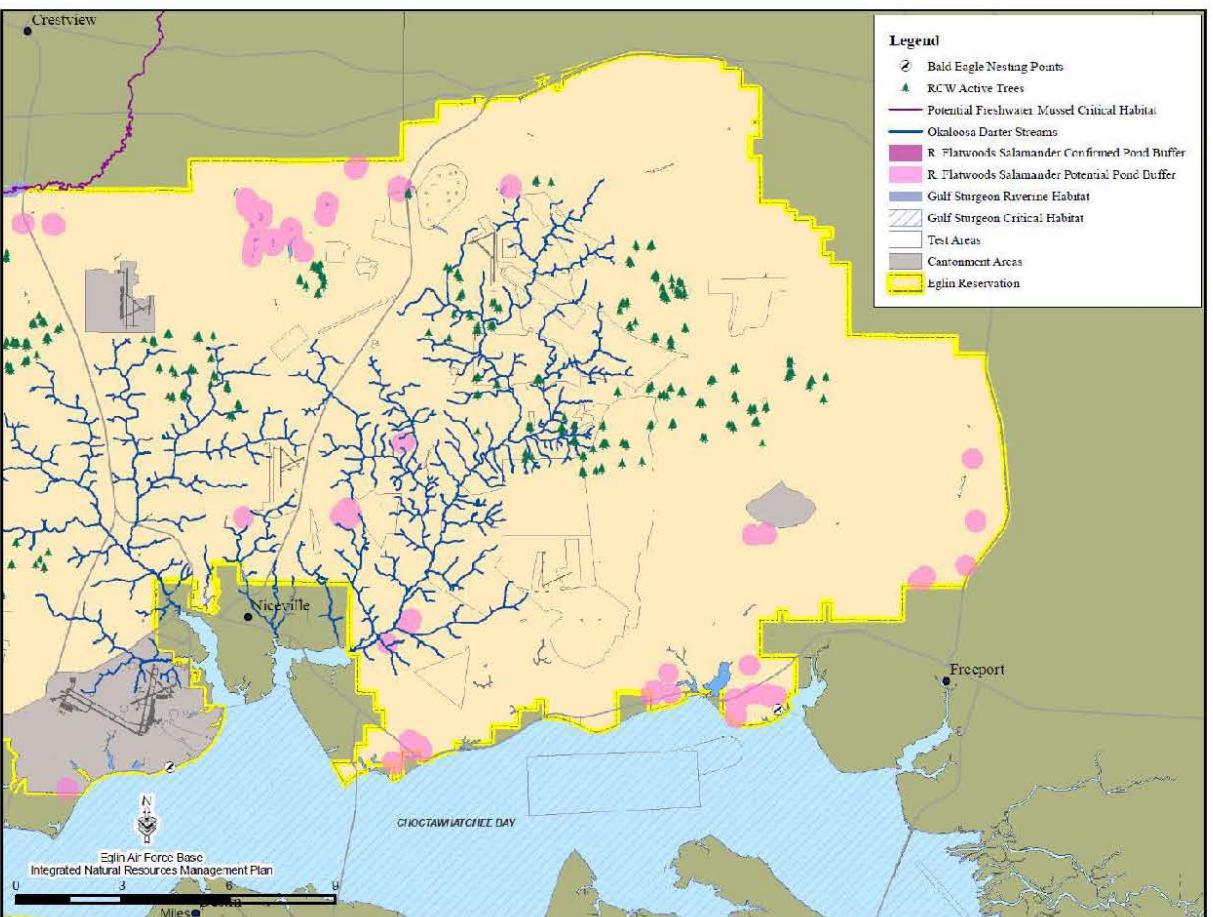


Figure 3-1. Sensitive Species and Critical Habitat at Eglin Mainland (East)

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-2

Biological Information

Federally Listed Species

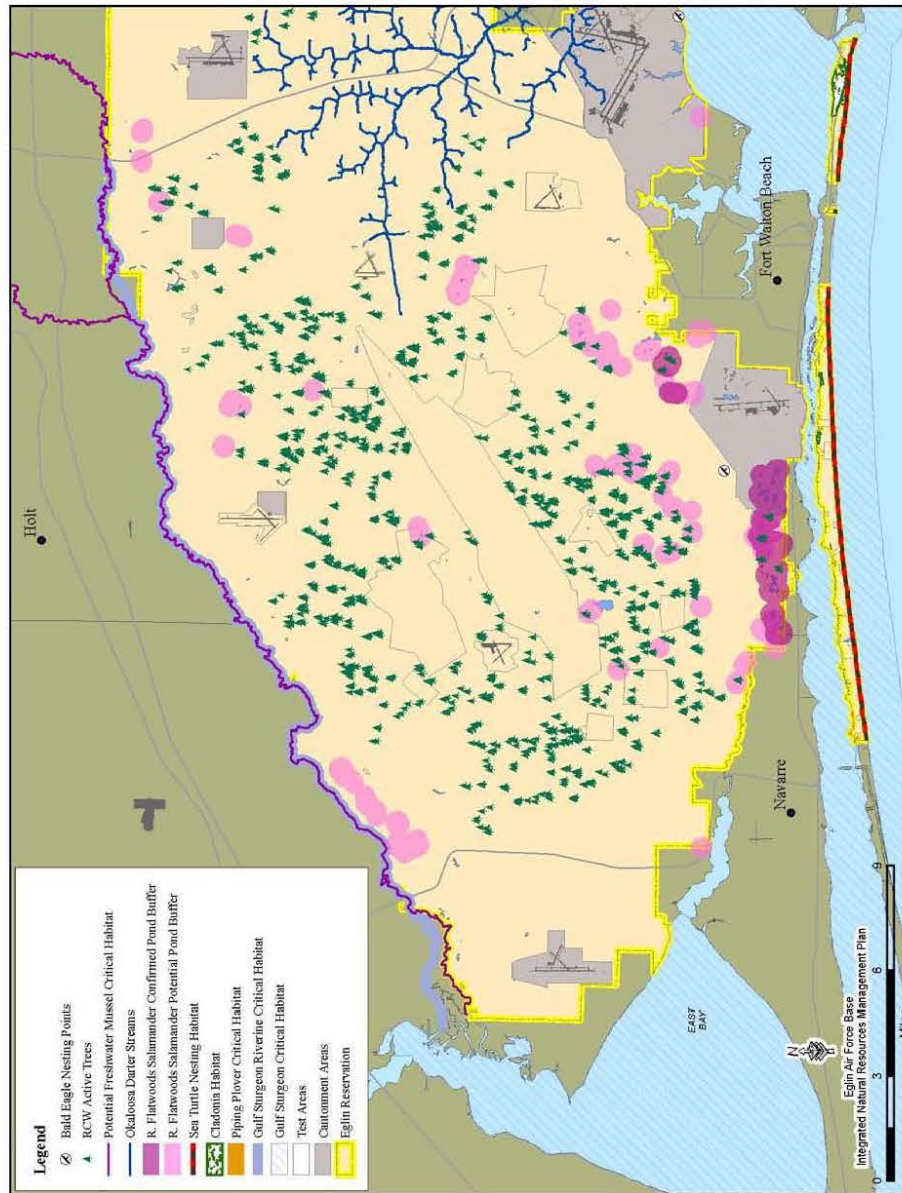


Figure 3-2. Sensitive Species and Critical Habitat at Eglin Mainland (West)

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-3

Biological Information

Federally Listed Species

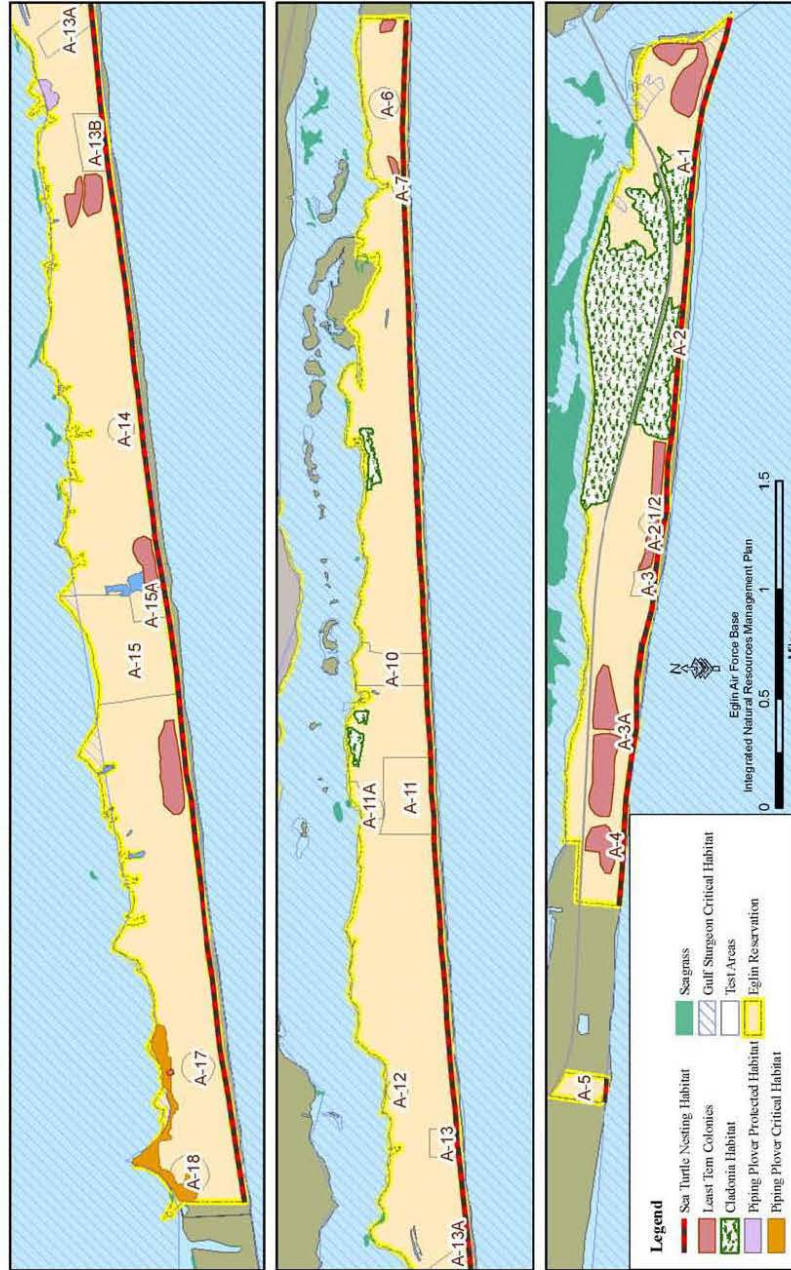


Figure 3-3. Sensitive Species and Critical Habitat at Santa Rosa Island

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-4

Biological Information

Federally Listed Species

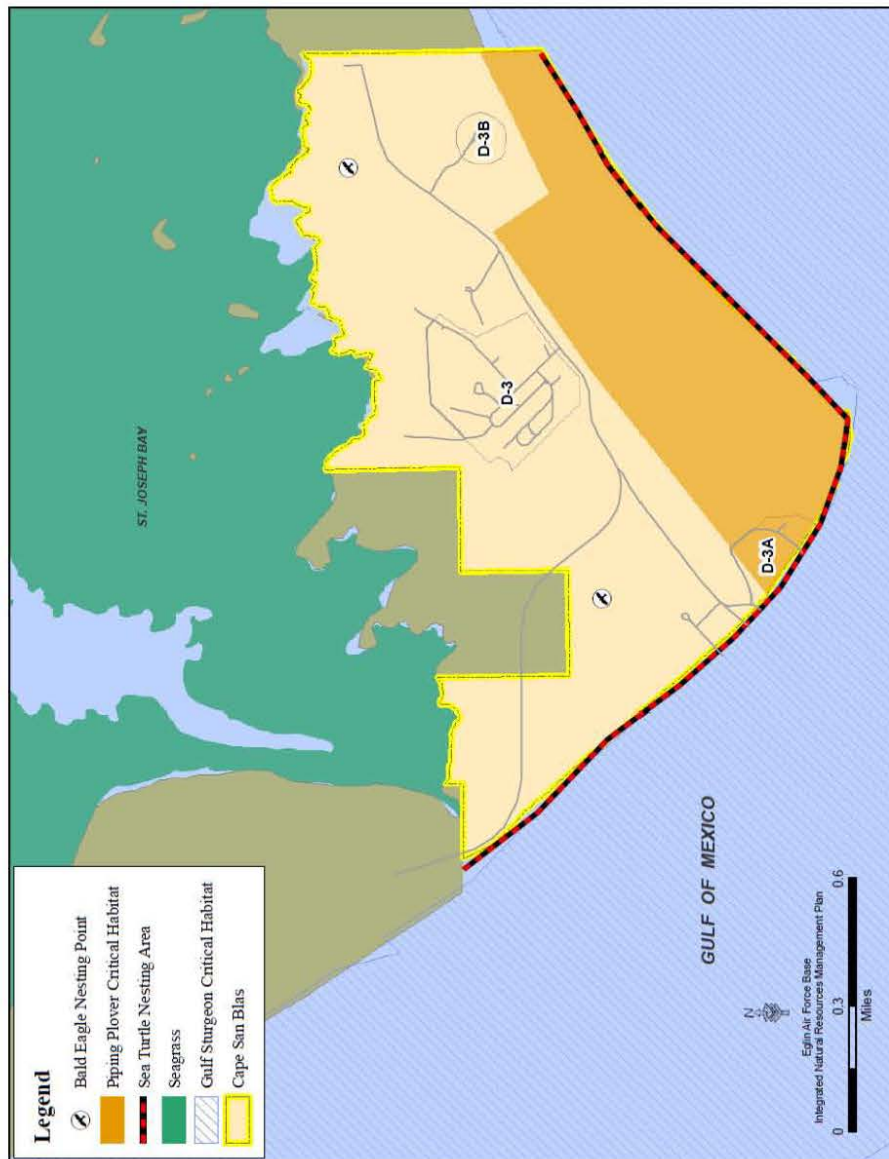


Figure 3-4. Sensitive Species and Critical Habitat at Cape San Blas

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-5

Biological Information

Federally Listed Species

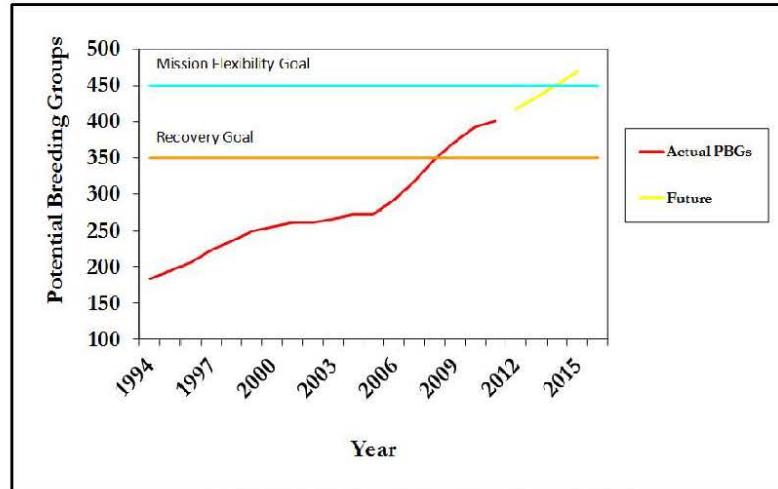


Figure 3-5. Eglin RCW Population Trends and Goals

Eglin maintains GIS location information for active RCW cavities, which are defined as any tree containing one or more cavities that are utilized by the RCW, and RCW foraging habitat around active clusters of RCW cavities (Figure 3-1 and Figure 3-2). The Eglin RCW population is divided into the eastern subpopulation, which comprises all clusters east of Highway 85, and the western subpopulation, which is comprised of all clusters west of Highway 85. The two populations are demographically separate and each subpopulation is in a different state of health. The western subpopulation is large and increasing (327 PBGs in 2011). The eastern subpopulation is smaller and stable but not increasing (74 PBGs in 2011).

RCW Habitat

High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal (Jackson et al., 1979). Depending on site productivity, different amounts of foraging habitat are required. In systems with medium to high productivity, only 120 acres may be needed, whereas sites with low productivity may need 200 to 300 acres of foraging habitat (USFWS, 2003). The NRS has determined that Eglin RCW groups utilize large areas for foraging habitat, thus Eglin generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 in dbh. Site conditions at Eglin are generally poor; the result is that longleaf pine tends to have smaller dbhs and lower densities than much of the rest of the RCW's range. Good quality foraging habitat on Eglin is defined as habitat that contains between 19 and 33 stems per acre of pines that are greater than 10 in dbh.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-6

Biological Information***Federally Listed Species***

Another requirement for good quality habitat is that it contains forbs and bunchgrasses in the understory, and has sparse or no hardwood midstory.

Eglin has developed an independent Oracle-based GIS tool (model) that creates foraging habitat assessments, allowing Eglin to consistently and accurately estimate the available foraging resources without sampling the entire Reservation (U.S. Air Force, 2006). The USFWS completed ESA Section 7 consultation on the model in June 2003, and concurred with Eglin NRS findings of “not likely to adversely affect.” Research has demonstrated that foraging analyses such as Eglin’s model accurately portray the actual territories of RCW groups (Convery and Walters, 2004).

The greatest threat to the RCW population is loss and fragmentation of its habitat. If timber is to be removed within 0.5 miles of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines (USFWS, 2003).

Eglin NRS has consulted with the USFWS on the guidelines for the habitat conditions and foraging requirements for RCWs on Eglin. Eglin NRS personnel use the guidelines identified in the *Threatened and Endangered Species Component Plan* (U.S. Air Force, 2006) when determining whether consultation with the USFWS is required. Table 3-1 is a comparison of the current Recovery Plan foraging standards and Eglin specific standards.

Table 3-1. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers

Measure	USFWS Recovery Standard	USFWS Managed Stability Standard	Eglin Recovery Standard	Eglin Managed Stability Standard
Acres	200-300	75	300	150
Density (stems per acre)	18 > 14 in dbh	None	20 > 10 in dbh	None
Density total (stems per foraging area)	None	None	6,000 > 10 in dbh	3,000 > 10 in dbh
Basal area (ft ² per acre)	20 > 14 in dbh	40-70 > 10 in dbh	20 > 10 in dbh	None
Basal area total (ft ²)	None	3,000 > 10 in dbh	6,000 > 10 in dbh	4,000 > 10 in dbh
Distance from cluster	0.5 mile	0.25 mile	0.5 mile	0.3 mile
Midstory height	7 feet	7 feet	7 feet	7 feet
Ground cover	>40% herb	None	> 40% herb	None

> = greater than; < = less than; dbh = diameter at breast height; ft² = square feet; in = inch

The first column contains the values defined in the Recovery Plan as the recovery standard for public lands. The second column contains the values defined in the Recovery Plan as the Managed Stability Standard for private lands in order to protect existing groups (USFWS, 2003). The last two columns are recommendations for Eglin’s Recovery Standard and Managed Stability Standard. A “no effect” determination would be made if a cluster’s foraging resources exceed Eglin’s Recovery Standard after the completion of a proposed action. A “not likely to adversely affect” determination would be made if a cluster’s foraging resources fall between Eglin’s Recovery Standard and Eglin’s Managed Stability Standard after the completion of a proposed action. A “likely to adversely affect” determination would be made if a cluster’s foraging resources fall below Eglin’s Managed Stability Standard after the completion of a

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-7

Biological Information***Federally Listed Species***

proposed action. Also, if the proposed action affects less than 1 percent of the foraging resources, and the foraging resources are above Eglin's Managed Stability Standard, then no consultation would be required.

3.1.2 Sea Turtles

Four species of sea turtles are known to nest on SRI and CSB beaches: the Atlantic green sea turtle, Atlantic loggerhead sea turtle, the leatherback sea turtle, and the Kemp's ridley sea turtle (Figure 3-3 and Figure 3-4). However, the majority of nests on SRI and all nests at CSB are from loggerhead sea turtles. The sea turtle nesting and hatching season in northwest Florida occurs from 01 May through 31 October, with most hatching between mid-August and mid-October.

Atlantic Green Sea Turtle

The green sea turtle was listed as federally threatened on 28 July 1978 in all its eastern range of North America, except in Florida where it is listed as endangered. It is also state-listed as endangered. In the United States, it nests in small numbers in Georgia, South Carolina, and North Carolina, and in larger numbers in Florida. The green turtle nesting aggregation in Florida is recognized as a regionally significant colony (USFWS North Florida Field Office [NFFO], 2009a). The officially recognized nesting and hatching season for the green sea turtle extends from 01 May through 31 October in Florida's panhandle. Eglin AFB SRI property supports the highest number of green sea turtle nests in northwest Florida. Primarily a tropical herbivore, the juveniles are frequently found in the Gulf of Mexico (GOM) in areas where there is an abundance of seagrass (USFWS NFFO, 2009a).

Atlantic Loggerhead Sea Turtle

The loggerhead turtle, federally and state-listed as threatened, gained its status on 28 July 1978. On March 16, 2010, the NMFS and USFWS proposed listing of nine distinct population segments of loggerhead sea turtles as endangered or threatened. Loggerhead nests in Florida account for ninety percent of all loggerhead nests in the United States. From March through June, adult loggerheads congregate in the nearshore and offshore waters of the GOM to mate. Their nesting sites are on the numerous barrier islands and beaches between the Florida Keys and the northern GOM. Nesting females approach SRI in the spring and summer to dig their nests between the high tide mark and the dune line and sometimes between dunes. Nest incubation averages 71 days. These turtles are the most commonly seen sea turtles in the southeastern United States and may be found near underwater structures and reefs (USFWS North Florida Ecological Services Office [NFESO], 2010). The diet of loggerheads consists of gastropods, mollusks, coelenterates, and cephalopods.

Leatherback Sea Turtle

The leatherback sea turtle was originally listed as federally endangered on 2 June 1970 and is considered a state-listed endangered species. This species commonly nests along the shorelines of the Atlantic, Pacific, and Indian Oceans (USFWS NFFO 2009b). Only infrequent nesting activity has been documented for the leatherback in northwest Florida. The officially recognized

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-8

Biological Information**Federally Listed Species**

nesting and hatching season for the leatherback extends from 01 March through 30 September, with nest incubation ranging from 60 to 75 days. Until the spring of 2000, the only confirmed leatherbacks nesting in northwest Florida were in Franklin and Gulf Counties. In May and June 2000, leatherback nesting activity was documented for the first time in Okaloosa County on Eglin's portion of SRI. The leatherback feeds primarily on jellyfish, but occasionally will eat sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle was originally listed as federally endangered on 2 December 1970. Adults have the most restricted distribution of any sea turtle and are typically confined to the GOM, while post-pelagic turtles can be found over crab-rich sandy or muddy bottoms. This species commonly nests from April to June along the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America (USFWS NFFO, 2009c). The Kemp's ridley is a rare nester on Eglin beaches and was documented for the first time in 2008 when three nests were deposited on SRI. One event was witnessed by spectators while the turtle was actually laying her eggs; the other two nests were confirmed by DNA testing. Since the confirmed nesting in 2008, Kemp's have returned to SRI in 2010 and 2011. Eglin Natural Resource biologists believe this is a new trend developing and will consider the Kemp's in the "take" analysis even though there are only a few years of data thus far.

SRI Sea Turtle Nesting and Hatching Rates

In order to determine potential take of sea turtles for INRMP activities on SRI, this section documents the most recent data on nesting periods, nesting activity and emergence, and other pertinent data to perform proper effects determinations. The sea turtle reproduction cycle on SRI has been divided into four time periods based on historical data (Table 3-2). During the first time period, only nesting occurs. During the second time period, hatchlings emerge from previously laid nests while adult sea turtles continue to come ashore to lay new nests. During the third time period, adults have ceased to come ashore for nesting, while hatchlings continue emerging from existing nests. During the fourth time period, neither nesting nor hatching behavior is expected to occur. The earliest and latest possible dates for all species were selected to produce the combined species time periods.

Table 3-2. Sea Turtle Nesting Periods by Species for SRI, Eglin AFB

Species	Nesting Only	Nesting and Hatching	Hatching Only	Off-Season
<i>Caretta caretta</i>	May 16 – July 19	July 20 – Aug 31	Aug 31 – Nov 5	Nov 6 – May 15
<i>Chelonia mydas</i>	May 20 – July 23	July 24 – Aug 22	Aug 23 – Oct 26	Oct 27 – May 19
<i>Dermochelys coriacea</i>	May 12 – Jun 19	N/A	Sep 09 – Sep 21	Sep 22 – May 11
<i>Lepidochelys kempi</i>	June 03 – July 03	N/A	N/A	N/A
Combined Species	May 12 – July 19	July 20 – Aug 31	Aug 23 – Nov 5	Nov 22 – May 11

Based on data collected between 1989 and 2011 on the 17 miles of Eglin SRI beaches, the average annual nesting density for loggerheads is approximately 1.15 nests per mile (Table 3-3). During this period, 452 loggerhead nests were recorded. Peak loggerhead nesting on SRI occurs in June and July, with approximately 84.7 percent of nests established during this period

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-9

Biological Information

Federally Listed Species

(Table 3-3). The average nest incubation length is 66.78 days. Loggerhead hatching peaks in August and September. The average annual nest emergence success rate is 53.7 percent.

Eglin's SRI property supports the greatest number of green sea turtle nests in northwest Florida. A total of 140 green sea turtle nests have been recorded in a 15 year nesting period, on average green sea turtles nest every other year (Table 3-3). The average annual nesting density for green sea turtles is approximately 0.55 nests per mile. Peak green sea turtle nesting occurs in June and July, with approximately 80.7 percent of nests established during this period (Table 3-3). The average nest incubation length is 68.24 days. Green sea turtle hatching peaks in August and September. The average annual nest emergence success rate is 55.7 percent.

Table 3-3. Sea Turtle Nesting on SRI, Eglin AFB

	Loggerhead	Green	Leatherback	Kemp's Ridley
Total number nests	452	140	3	5
Years nesting documented	1989-2011	1990, 1992, 1994, 1996, 1997, 1998, 2000, 2002, 2003, 2005, 2006, 2007, 2008, 2010, 2011	2000	2008, 2010
Earliest documented nest	May 16	May 20	May 12	June 3
Latest documented nest	Aug 31	Aug 22	June 19	July 3
Average annual number of nests	19.6	9.3	insufficient data	insufficient data
Average annual number of nests per mile	1.15	.55	insufficient data	insufficient data
Peak nesting period (two peak months)	June and July	June and July	insufficient data	insufficient data
Percentage of nests laid during the two peak months	84.7%	80.7%	insufficient data	insufficient data
Peak hatching period (two peak months)	August and September	August and September	insufficient data	insufficient data
Average number eggs in a nest	110.3	139.4	insufficient data	insufficient data
Average annual nest emergence success rate	53.7%	55.7%	insufficient data	insufficient data
Incubation period (range)	52-89 days	51-82 days	insufficient data	insufficient data
Incubation period (average)	66.78 days	68.24 days	insufficient data	insufficient data
Estimated number of hatchlings produced annually*	2161.9	1291.4	insufficient data	insufficient data

* Assumes 100 percent survival

Leatherback nesting has been documented only one year on Eglin SRI, during 2000. Three nests were laid in May and June and hatched in August and September. The Kemp's ridley sea turtle has recently been confirmed to nest on SRI during the 2008 and 2010 nesting season. The nests have not had viable eggs, so no hatching data are available for this species. Not enough data are available for these two species of sea turtles to calculate average annual nesting density.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-10

Biological Information

Federally Listed Species

Loggerhead nesting peaks in June (Figure 3-6). Dividing the average number of nests occurring in June by 30 days yields a peak nesting emergence rate of 0.32 nests per night. By the same method, during a green turtle nesting year, the peak nesting emergence rate is calculated to be 0.14 nests per night (average number of green turtle nests in July, divided by 31 days). The Kemp's Ridley peak nesting rate is calculated to be 0.06 (average number of Kemp's nests in May, divided by 31). To determine the peak nesting rate within a 0.5-mile section of beachfront, the peak nesting emergence rate for each species is divided by the number of 0.5-mile segments comprising Eglin AFB sea turtle nesting beach (i.e. 34). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.01 nests per night per 0.5 mile, the peak rate of green turtle nesting emergences is 0.004 nests per night per 0.5 mile, and the peak rate of Kemp's nesting is 0.001 per 0.5 mile. Because only three leatherback nests have been documented on Eglin AFB SRI over a 23-year period, the leatherback nesting emergence rate is effectively nil.

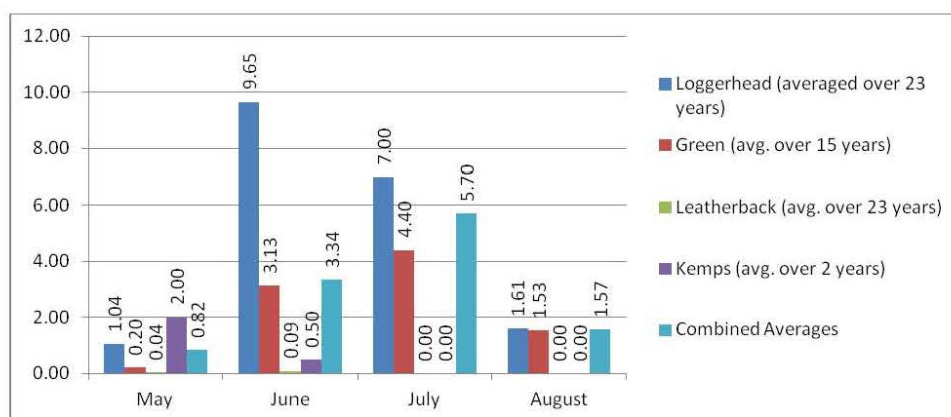


Figure 3-6. Average Sea Turtle Nest Occurrences by Month (1989-2011) for SRI, Eglin AFB

Because historical hatchling emergence data for Eglin AFB SRI are incomplete, an expected average emergence by month was calculated for each species based on the available emergence data. For example, hatchling emergence dates have been recorded for 245 of 452 total loggerhead nests. Of the 245 recorded hatchling dates, only five (2.04 percent) occurred in July. If this percentage is applied to the total number of loggerhead nests recorded, 9.2 loggerhead nests would be expected to have hatched in July over the 23-year data collection period, yielding an average of 0.4 loggerhead hatchlings annually during the month of July. Once again, the total for green sea turtles was averaged over 15 years. Table 3-4 summarizes this information and also provides an estimated number of hatching events expected in each given month. Emergence dates are not available for a randomly selected sample of nests for each species, and therefore these averages may be slightly skewed. However, because emergence dates were available for 325 out of the 592 total nests (55 percent), the calculated averages for the number of nests hatching per month should suffice for purposes of this analysis (Table 3-4).

Biological Information

Federally Listed Species

Table 3-4. Average Sea Turtle Hatching Occurrences by Month for SRI, Eglin AFB

		Loggerhead	Green	Leatherback	Kemp's	Combined
	Total nests	452	140	3	5	600
	No. nests with recorded hatching dates	247	78	2	0	327
July	Calculated average	0.39	0.24	0.0	NA	0.32
August	Calculated average	10.7	2.75	0.0	NA	6.73
September	Calculated average	6.84	4.18	0.09	NA	3.70
October	Calculated average	1.59	2.15	0.0	NA	1.87
November	Calculated average	0.16	0.0	0.0	NA	0.08

Cape San Blas Loggerhead Nesting and Hatching Rates

The loggerhead sea turtle is currently the only documented sea turtle species to nest at CSB. However, in recent years, areas adjacent to CSB have documented nesting Kemp's ridley sea turtles. This section documents the most recent data on its nesting period, nesting activity and emergence, and other pertinent data to perform proper effects determinations. The sea turtle reproduction cycle on CSB has been divided into four time periods just like for SRI based on historical data (Table 3-5).

Table 3-5. Sea Turtle Nesting Periods for CSB, Eglin AFB

Species	Nesting Only	Nesting and Hatching	Hatching Only	Off-Season
<i>Caretta caretta</i>	May 01 – June 27	May 01 – Oct. 13	Sep 30 – Oct. 13	Oct. 14 – Apr. 30

Based on data collected between 1994 and 2011 on the 3 miles of CSB beaches, the average annual nesting density for loggerheads is approximately 14.1 nests per mile (Table 3-6). During this period, 763 loggerhead nests were recorded. Peak loggerhead nesting on CSB occurs in June and July, with approximately 72.7 percent of nests established during this period (Table 3-6). The average nest incubation length is 61.3 days. Loggerhead hatching peaks in June and July. The average annual nest emergence success rate is 39.2 percent.

Loggerhead nesting peaks in July (Figure 3-7). Dividing the average number of nests occurring in July by 31 days yields a peak nesting emergence rate of 0.51 nests per night. To determine the peak nesting rate within a 0.5-mile section of beachfront, the peak nesting emergence rate for each species is divided by the number of 0.5-mile segments comprising CSB sea turtle nesting beach (i.e., 6). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.09 nests per night per 0.5 mile.

Biological Information

Federally Listed Species

Table 3-6. Loggerhead Nesting on CSB, Eglin AFB

	Loggerhead
Total number nests	763
Years nesting documented	1994-2011
Earliest documented nest	May 01
Latest documented nest	June 27
Average annual number of nests	42.4
Average annual number of nests per mile	14.1
Peak nesting period (two peak months)	June and July
Percentage of nests laid during the two peak months	72.7%
Peak hatching period (two peak months)	August and September
Average number eggs in a nest	99.9
Average annual nest emergence success rate	39.2%
Incubation period (range)	49-82 days
Incubation period (average)	61.3 days
Estimated number of hatchlings produced annually*	4236.3

*Assumes 100 percent survival

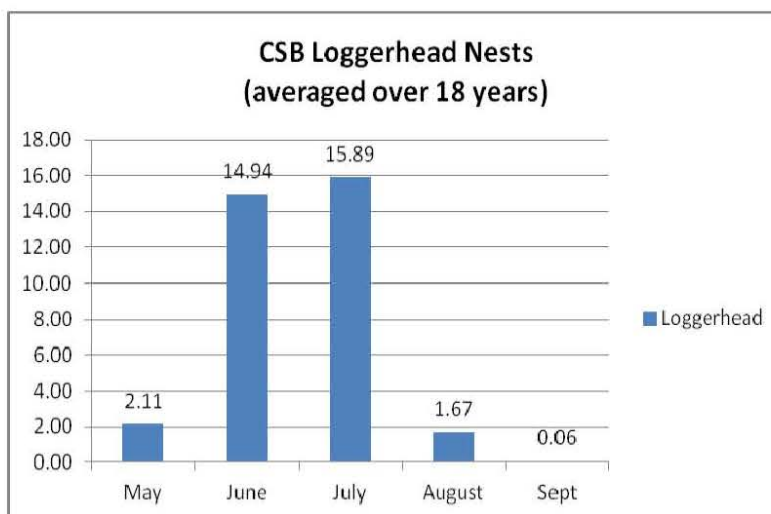


Figure 3-7. Average Loggerhead Nest Occurrences by Month (1994-2011) for CSB, Eglin AFB

Because historical hatchling emergence data for CSB are incomplete, an expected average emergence by month was calculated for the loggerhead based on the available emergence data. For example, hatchling emergence dates have been recorded for 245 of 624 total loggerhead nests. Of the 245 recorded hatching dates, only 5 (2.04 percent) occurred in July. If this percentage is applied to the total number of loggerhead nests recorded, 15.8 loggerhead nests would be expected to have hatched in July over the 18-year data collection period, yielding an average of 0.88 loggerhead hatchlings annually during the month of July. Table 3-7 summarizes

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-13

Biological Information

Federally Listed Species

this information and also provides an estimated number of hatching events expected in each given month. Emergence dates are not available for a randomly selected sample of nests for each species, and therefore these averages may be slightly skewed. However, because emergence dates were available for 245 out of the 624 total nests (39.2 percent), the calculated averages for the number of nests hatching per month should suffice for purposes of this analysis (Table 3-7).

Table 3-7. Average Loggerhead Hatching Occurrences by Month at CSB, Eglin AFB

		Hatchings
	Total nests	624
	Nests with recorded hatching dates	245
July	Calculated average	2.55
August	Calculated average	20.9
September	Calculated average	0.99
October	Calculated average	0.99
November	Calculated average	0.14

3.1.3 Reticulated Flatwoods Salamander

The reticulated flatwoods salamander (*Ambystoma bishopi*) is state and federally listed as endangered. Based on molecular and morphological analyses, Pauly et al. (2007) proposed the separation of the flatwoods salamander into two species. The division lies along the Apalachicola-Flint Rivers with reticulated flatwoods salamanders (*Ambystoma bishopi*) inhabiting areas to the west and frosted flatwoods salamanders (*A. cingulatum*, federally threatened) ranging to the east of the rivers. There are 20 known breeding ponds for the flatwoods salamander on the Eglin Range (Figure 3-2). Additionally, the Eglin Range supports approximately 17,000 acres of potential salamander habitat in mesic flatwoods (Figure 3-1 and Figure 3-2).

Optimal habitat for this small mole salamander is open, mesic (moderately wet) woodlands of longleaf or slash pine flatwoods maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Males and females migrate to these ephemeral ponds during the cool, rainy months of October through December. The females lay their eggs in vegetation at the edges of the ponds. Flatwoods salamanders may disperse long distances from breeding sites to upland sites where they live as adults (U.S. Air Force, 2006).

The primary threat to the flatwoods salamander is loss of mesic habitat through the filling in of wetlands and other alterations to the landscape hydrology. Flatwoods salamander habitat is also threatened by the introduction of invasive, non-native species. Flatwoods salamanders and their active breeding wetlands both appear to have declined in number since the original Eglin surveys in 1993 and 1994. This is possibly due in part to several years of drought in the late 1990s and early 2000s. Wetlands may not have remained wet long enough for larvae to complete metamorphosis if rainfall amounts were not sufficient. This has resulted in little population recruitment over the last decade at Eglin's wetlands (U.S. Air Force, 2006).

The USFWS guidelines in the Federal Register, dated 1 April 1999, establish a 450-meter (1,476-foot) buffer area from the wetland edge of confirmed breeding ponds. Within the buffer area, the guidelines restrict ground-disturbing activities in order to minimize the potential for

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-14

Biological Information**Federally Listed Species**

direct impacts to salamanders, the introduction and spread of invasive non-native plant species, and alterations to hydrology and water quality.

3.1.4 Okaloosa Darter

The Okaloosa darter (*Etheostoma okaloosae*) is a small state and federally threatened fish. Spawning occurs from March to October, with the greatest amount of activity taking place during April. The entire global population of this species is found in the tributaries and main channels of Toms, Turkey, Mill, Swift, East Turkey, and Rocky Creeks, which drain into two bayous of Choctawhatchee Bay (Figure 3-1 and Figure 3-2). These seepage streams have persistent discharge of clear, sand-filtered water through sandy channels, woody debris, and vegetation beds. The Eglin Range contains 90 percent of the 457-square kilometer (176 square mile) drainage area.

The most immediate threat to the Okaloosa darter is loss of habitat through degradation of stream water quality from soil erosion into streams. The sources with high soil and sediment erosion probability are borrow pits, clay roads that cross streams, and a few test area sites where vegetation is maintained by using choppers on slopes. A 1992 study identified erosion from borrow pits and roads as major contributors to the degradation of darter habitat. Mission activities could avoid further degradation of stream quality by keeping vehicle activity and troop movement confined to trails, bridges, and roads and conducting ground-disturbing activities only outside of a 300-foot buffer around Okaloosa darter streams. These procedures are available to minimize sediment erosion into the darter watersheds and to avoid a consultation process under ESA regulations (U.S. Air Force, 2006).

The darter was downlisted from endangered to threatened in March of 2011. Eglin AFB is protecting in-stream flows and historical habitat through management plans, conservation agreements, easements, and/or acquisitions; is implementing an effective habitat restoration program to control erosion from roads, clay pits, and open ranges; is demonstrating that the Okaloosa darter population is stable or increasing and that the range of the Okaloosa darter has not decreased at all historical monitoring sites; and is seeing that no foreseeable threats exist that would impact the survival of the species.

3.1.5 Eastern Indigo Snake

The eastern indigo snake (*Drymarchon couperi*) is listed as a federal and state threatened species, and is the largest nonvenomous snake in North America. The primary reason for its listing is population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of others species for over-wintering. The snake frequents flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The indigo snake could occur anywhere on the Eglin Range because it uses such a wide variety of habitats (U.S. Air Force, 2006).

The species is extremely uncommon on the Eglin Range with the sighting of only 29 indigo snakes throughout the Eglin Range from 1956 to 1999, and no reported sightings since 1999

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-15

Biological Information***Federally Listed Species***

(Gault, 2009). Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even estimate of the number of these snakes due to the secretive nature of this species.

3.1.6 Gulf Sturgeon and Critical Habitat

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that spends part of its life cycle in the marine environment and part in riverine environments. The Gulf sturgeon migrates from salt water into large coastal rivers to spawn and spend the warm months. It lives predominately in the northeastern Gulf of Mexico (GOM), where it ranges from the Mississippi Delta east to the Suwannee River in Florida. However, it can be found in the bays and estuaries throughout this range. Spawning takes place during April through June in fresh water, such as the Yellow River, which borders Eglin AFB along the northwest.

Preliminary data from Eglin/USFWS (unpublished at this time) indicate that Gulf sturgeon begin moving to the Gulf in late October/early November. The fish are detected off Eglin's SRI property until approximately mid-December, when they generally migrate east and west out of the area, possibly to aggregation sites that have been detected near Perdido Key, Alabama, and near Panama City, Florida. Few fish are detected off Eglin's property between mid-December and mid-March, when the sturgeon begin returning to riverine environments. Initial data show that 82 percent of the detections occurred within approximately 500 meters of the shoreline, in water depth less than 40 feet. Further, 99 percent of detection occurred within approximately 1,000 meters of the shore, in water depths less than 60 feet (only 1 percent of detections occurred in water depths of 60 feet or greater). These data support the hypothesis that Gulf sturgeon offshore migrations typically occur in water depths of 40 feet or less.

Critical habitat for the Gulf sturgeon was designated in March 2003. *Critical habitat* is a term that refers to specific geographic areas that contain the essential habitat features necessary for the conservation of threatened and/or endangered species. Critical habitat areas may require special protection or management considerations for current populations as well as potential population increases necessary to achieve species recovery. Features include food, water, shelter, breeding areas, and space for growth, among other requirements. In the Final Rule for the designation of critical habitat for the Gulf sturgeon, seven primary constituent elements are identified.

- Abundant food items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for adult and subadult life stages.
- Riverine spawning sites with suitable substrate.
- Riverine aggregation areas (resting, holding, or staging areas).
- Proper stream flow regime for all life stages.
- Adequate water quality for all life stages.
- Adequate sediment quality for all life stages.
- Safe and unobstructed migratory pathways for passage within and between riverine, estuarine, and marine habitats.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-16

Biological Information**Federally Listed Species**

Critical habitat for the Gulf sturgeon is comprised of 14 geographic areas, or units. The units collectively encompass almost 2,800 river kilometers and over 6,000 square kilometers of estuarine and marine habitat. As pertains to Eglin, critical habitat is delineated for the Yellow River, East Bay, Santa Rosa Sound, and Choctawhatchee Bay, and extends from the mean high-water line to 1 nautical mile offshore in the GOM at SRI and CSB (Figure 3-1 to Figure 3-4).

3.1.7 Piping Plover and Critical Habitat

The piping plover (*Charadrius melodus*) is listed as “threatened” by both the State of Florida and federally. This bird’s primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies. Piping plovers are commonly documented during winter in the Florida panhandle, with highest numbers of birds occurring in Franklin, Gulf, and Bay counties. At Eglin the winter foraging period runs from 15 July to 15 May.

Essential habitat features for piping plovers include coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Even though Florida has not been considered a primary wintering area for piping plover, diminishing habitat along other Gulf coast areas may be affording the piping plover new wintering grounds in Florida. These wintering grounds are still considered less suitable, thus forcing the piping plover to utilize isolated patches. As a result, critical habitat has been designated for piping plovers along the Gulf coast of Florida, a portion of which covers SRI north of Test Site A-18 (Figure 3-3). At Cape San Blas, the critical habitat unit includes the area known as the Cape between the eastern boundary of Eglin and mile marker 2.1, including the peninsula and all emerging sandbars (Figure 3-4). Eglin NRS personnel have also designated other protected areas on SRI that are considered additional protected habitat areas based on historical surveys and are afforded the same protection as designated critical habitat. Eglin has posted designated piping plover critical habitat at SRI and CSB. Posted signs at CSB designate “Endangered Species Habitat” and are designed to prevent driving landward of the signs, thus protecting plovers from vehicle impacts.

3.1.8 Florida Perforate Lichen

Florida perforate lichen (*Cladonia perforata*) is federally listed as “endangered” and has a very restricted population, attributable primarily to a significant loss of its historic habitat. The lichen is endemic to Florida’s white sand scrub habitat dominated by sand pine, rosemary, and other scrub oaks such as sand oak, live oak and myrtle oak. It typically occurs in open areas between patches of scrub vegetation. In addition to habitat loss, it is also threatened by trampling/human disturbance, storm surge overwash, and is susceptible to fires (USFWS, 1999).

In an attempt to protect the known populations, Eglin NRS maintains posted signs and barriers to discourage foot traffic and AF operational activities within the *Cladonia* habitat areas (Figure 3-3). Additionally, to discourage human disturbance and increase general awareness, informational signs are posted at official beach access points regarding the barrier island ecosystem and the species it supports.

Biological Information

Federally Listed Species

3.1.9 Freshwater Mussels

Four species, the southern sandshell (*Hamiota australis*), Choctaw bean (*Villosa choctawensis*), fuzzy pigtoe (*Pleurobema strodeanum*), and the narrow pigtoe (*Fusconaia escambia*), have habitat ranges that border Eglin AFB and are federal candidates for listing as threatened or endangered. These freshwater mussels are found only in the Yellow, Escambia, and Choctawhatchee River drainages in Florida and Alabama. From the 1990s to 2004, surveys have documented declines in the numbers of these candidate mussel species (Blalock-Herod et al., 2002; Pilarczyk et al., 2006). Furthermore, these surveys have been unable to capture many of these mussel species at sites where they were previously known to occur. These local extirpations and reductions in numbers are attributed to habitat alteration from various sources. Preferred habitats are creeks and rivers with slow to moderate currents and sandy substrates.

Presently, insufficient information is available to reliably estimate populations of the listed freshwater mussel species. However, to provide occurrence and population data, the USFWS personnel stationed at Jackson Guard have begun to survey and monitor freshwater mussels on Eglin in the critical habitat segments of the Yellow and Shoal Rivers. These assessments include snorkel surveys, scuba surveys, and benthic habitat characterization.

3.2 OTHER SPECIES CONSIDERED**3.2.1 Gopher Tortoise**

The gopher tortoise (*Gopherus polyphemus*) is a state threatened species. In December 2008, all Department of Defense entities, including the Air Force, as well as state agencies and other non-governmental organizations signed a Candidate Conservation Agreement with the USFWS. This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. The Federal Register Vol. 76, No. 144 / Wednesday, July 27, 2011 recently documented the 12-month finding on a petition to list the gopher tortoise as threatened in the eastern portion of its range. The review found that the listing of the gopher tortoise is warranted; however, listing is precluded by higher priority actions. The Federal Register notice also states that it will be added to the federal candidate list and a proposed rule to list the gopher tortoise will be developed as priorities allow.

The gopher tortoise is found primarily within the sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake.

3.2.2 Florida Bog Frog

The Florida bog frog (*Rana okaloosae*) a species of special concern by the state, can only be found within Walton, Okaloosa, and Santa Rosa Counties. Most of the habitat for the frog lies

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-18

Biological Information**Other Species Considered**

on Eglin AFB property with all known locations of the frog in small tributary streams of the Yellow, Shoal, and East Bay Rivers (Figure 3-1 and Figure 3-2).

3.2.3 Florida Burrowing Owl

The Florida burrowing owl (*Athene cunicularia floridana*) is a state species of special concern. The owl creates burrows, similar to gopher tortoise burrows, in which to hide from predators. They are typically found in open habitats with short grasses and few trees. These small owls have been seen on many test areas across the Eglin Range, but the confirmed areas are on TA B-70 and TA B-75 (Figure 3-2).

3.2.4 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is protected by the Bald and Golden Eagle Protection Act. Eagles are territorial and exhibit a strong affinity for a nest site once a nest has been established. It is common for a breeding pair to rebuild damaged or lost nests in the same tree or in an adjacent tree. Individual pairs return to the same territory year after year and territories are often inherited by subsequent generations. The nesting period in the southeast United States extends from 1 October to 15 May with most nests being completed by the end of November. In northwest Florida, most successful nests are laid by mid-February. The quality and amount of forage resources, mainly fish and carrion, heavily influence fledgling survival.

Bald eagles are currently known to have active nests in two areas of Eglin AFB: one nest is located in Okaloosa County on the Eglin Main Base Cantonment Area between Cobb's Overrun and Test-Area A-22 on the shore of Choctawhatchee Bay, and two nests are located in Gulf County at CSB (Figure 3-2 and Figure 3-4). The main base nest was discovered in 1998 and since then has produced 15 fledglings. Eglin Natural Resources was permitted in 2011 to remove the nest tree for the eagles located on Main Base due to BASH concerns. The original nesting tree was removed on August 23, 2011; however, the eagles have built a new nest in a tree near the area. There is one inactive eagle nest located on Eglin property at Alaqua Bayou. A survey of the area revealed a nesting pair using Eglin property for foraging while nesting in another nest on private land across Alaqua Bayou. Another potential eagle nest is north of the Hurlburt airfield and south of the East Bay River in very dense swamp habitat. It was reported by FNAI staff conducting helicopter flights to document great blue heron nests in the swamp north of Hurlburt. This potential nest will need to be monitored from a helicopter, due to its remote location and accessibility.

No nesting productivity was documented at CSB until 1998, and since then 13 fledglings have been documented. Throughout the years, several CSB nest trees have been lost due to hurricanes and rapid shoreline erosion. However, after each loss, the eagles rebuilt a new nest in the same general area. In late 2011, a new eagle nest was discovered at CSB; this nest has produced one fledgling this 2011–2012 breeding season.

3.2.5 Santa Rosa Beach Mouse

The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is one of seven extant beach mouse subspecies, five of which inhabit the panhandle of Northwest Florida. Of the five

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-19

Biological Information**Other Species Considered**

gulf subspecies, the Santa Rosa subspecies is the only one not currently listed by either the state or the federal government. Beach mice are mostly nocturnal, and burrow nests in dunes. They inhabit frontal dune and scrub habitat within the coastal dune ecosystem on SRI, preferring sand-covered slopes with patches of grasses and herbs, and their diet consists of seeds and fruits of beach plants, as well as insects.

Beginning in 2004, Eglin NRS increased survey frequency and began conducting surveys every other month to determine the severity of the impact of past hurricanes to the population. Since then, preliminary results indicate that beach mice are still present, but additional data are required to determine the status of the current population. To supplement track-count surveys, Eglin NRS has also incorporated the FWC tracking tube survey protocol (surveys occur every two months). Tracking tube surveys now provide data regarding the presence/absence of beach mice in varied ecosystems on Eglin's portion of SRI. This tracking tube method has been developed as a potential alternative to survey for presence/absence of the species. By maintaining both survey types, Eglin NRS hopes to provide comparative data regarding the subjectivity for each method. Beginning 2012 Eglin NRS will conduct track counts on a quarterly basis and incorporate tracking tube surveys every six months; however, if a severe weather event occurs, Eglin NRS would resume a more aggressive monitoring approach.

3.2.6 Shorebirds

The following protected species of shorebirds are typically found at SRI and CSB:

Common Name	Scientific Name	State Status
American brown pelican	<i>Pelecanus occidentalis</i>	SSC
American avocet	<i>Recurvirostra americana</i>	FNAI-Tracked Species
American oystercatcher	<i>Haematopus palliatus</i>	SSC
Black skimmer	<i>Rhynchopsniger</i>	SSC
Caspian tern	<i>Sterna caspia</i>	FNAI-Tracked Species
Great egret	<i>Ardea alba</i>	FNAI-Tracked Species
Least tern	<i>Sterna antillarum</i>	T
Little blue heron	<i>Egretta caerulea</i>	SSC
Red knot*	<i>Calidris canutus</i>	Candidate for Federal Listing
Reddish egret	<i>Egretta rufescens</i>	SSC
Roseate spoonbill	<i>Platalea ajaja</i>	SSC
Royal tern	<i>Sterna maxima</i>	FNAI-Tracked Species
Sandwich tern	<i>Sterna sandvicensis</i>	FNAI-Tracked Species
Snowy egret	<i>Egretta thula</i>	SSC
Snowy plover	<i>Charadrius alexandrinus</i>	T
Tricolor heron	<i>Egretta tricolor</i>	SSC
White ibis	<i>Eudocimus albus</i>	SSC
Wilson's plover	<i>Charadrius wilsonia</i>	FNAI-Tracked Species

* The red knot is further detailed in Section 3.2.7.

Santa Rosa Island

Shorebird nesting season is approximately 01 March through 31 August. Although natural forces including hurricane activity continually change the landscape of SRI, Eglin NRS observes and documents areas that appear to be preferred by nesting shorebirds. In an attempt to

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-20

Biological Information**Other Species Considered**

designate and protect these areas, Eglin NRS posts signs to discourage foot traffic and mission activities.

Eglin biologists have also conducted a snowy plover banding project on SRI over the past three years. This species has the potential to become federally listed in the near future. Results show that some snowy plovers nest in the same location each year, while others use different locations in the same general area. Nest site selection is highly variable among birds. Some birds nest on bare sand in flat areas in front of, between, or behind dunes. Others nest on top of dunes in grass, or in rocky areas. Banded birds were seen wintering as far west as Biloxi, Mississippi, and as far south as central Florida.

Cape San Blas

Shorebird colonies are found on the eastern shore of CSB, but there are no officially designated shorebird nesting areas. Shorebird surveys from 1994 to 2001 were conducted weekly at Cape San Blas along the shoreline from Indian Pass to the CSB lighthouse. Gulf County volunteers conducted monthly surveys from 2001-2011. In August 2011, Cape San Blas personnel have started conducting weekly shorebird surveys again. CSB personnel are currently collecting GPS data for the red knot as it is a candidate for federal listing and is discussed in the section below.

3.2.7 Red Knot

Red knots fly more than 9,300 miles from south to north every spring and repeat the trip in reverse every autumn. Surveys of wintering knots along the coasts of southern Chile and Argentina and during spring migration in Delaware Bay on the U.S. coast indicate a serious population decline. One of the most important aspects of its survival is the continued availability of billions of horseshoe crab eggs at major North Atlantic staging areas, notably the Delaware Bay and Cape May peninsula. The increase in taking of horseshoe crabs for bait in commercial fisheries that occurred in the 1990s may be a major factor in the decline in red knots (USFWS, 2012).

Red knots break their spring and fall migrations into stopover sites called staging areas. The species are faithful to these specific sites, stopping at the same location year after year. CSB personnel are currently collecting GPS data for the red knot as it is a candidate for federal listing. This data will be important to preclude listing of critical habitat on Air Force property and will be documented in the T&E Species CP to ensure it would meet the requirements for exemption. The red knot conservation measures will likely mimic the piping plover.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-21

Biological Information

Other Species Considered

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04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 3-22

Effects Determination

Federally Listed Species

4. EFFECTS DETERMINATION

This section discusses potential impacts to protected species located within and adjacent to the action area. Analysis focuses on assessing the potential for impacts from INRMP activities and on identifying methods to reduce the potential for negative impacts to protected species from these activities.

Based on the scope of the Proposed Action potential impacts to sensitive species from implementing INRMP activities can be categorized as follows:

Direct Physical Impacts—Physical harm (i.e., injury or mortality) to listed species as a result of human activities. The main cause of direct physical impacts associated with the Proposed Action is physical contact, which could involve the crushing/trampling of, or collision with, a species due to vehicle traffic or human movements resulting in physical damage or mortality of a species.

- **Harassment**—Actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Activities under the Proposed Action may result in harassment due to the following:
 - **Nest/burrow destruction**—Destruction of a nest or burrow due to excessive ground disturbance, causing a species to relocate.
 - **Foraging/nesting disturbance**—Disruption of normal breeding/nesting or foraging activity.
- **Habitat Impacts**—Habitat impacts include loss, alteration, and/or degradation of habitat. These impacts characterize the physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to the sustainment of a species. A habitat in this instance refers to the ecological and geomorphological components, such as vegetation, soil, topography, and water that support listed species. Activities under the Proposed Action may result in habitat impacts due to the following:
 - **Soil erosion**—Loss of soil due to ground disturbing activities occurring in or near sensitive species habitat resulting in habitat loss, alteration, or degradation.
 - **Sensitive habitat degradation**—Degradation or destruction of sensitive habitats such as wetland areas or foraging habitat resulting from human activities.

4.1 FEDERALLY LISTED SPECIES**4.1.1 Red-cockaded Woodpecker**

Prescribed Fire. To maintain high-quality RCW foraging habitat, fire is prioritized in active RCW clusters at a return interval of between 2 and 3 years using Eglin's fire prioritization model (Hiers et al., 2003). Due in large part to an aggressive prescribed fire program, the RCW population on Eglin exceeded the designated recovery goal of 350 potential breeding groups (PBGs) in 2009.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-1

Effects Determination**Federally Listed Species**

To meet Eglin's mission flexibility goal of at least 450 PBGs by 2015, at a minimum prescribed fire must continue at current levels.

To reduce the potential for fire damage to RCW cavity trees, fire crews prepare all active RCW cavity trees in prioritized burn blocks by cutting fuels around the individual cavity trees out to a distance of approximately 5 meters using a Brown tree cutter, Positrack mower, or D.R. mower mounted behind an all-terrain vehicle (ATV), and then raking the clippings away from the trees with rakes. At Eglin when trees have been prepared in advance, average cavity tree mortality has been reduced from 6 percent to 2 percent (Williams et al., 2004).

In addition to the fire preparation that takes place around cavity trees, a trained RCW monitor who is familiar with fire behavior is present on all prescribed burns that involve active clusters or recruitment clusters, except those within UXO restricted suppression areas (Figure 2-2). The monitor observes trees that have a high risk of being burned during the fire, lights a backing fire at the outer edge of the mowed circle of reduced fuel, and has input on firing patterns in order to minimize potential damage to cavity trees. The monitor may also stop a burn if conditions are deemed harmful to cavity trees or significant portions of foraging habitat.

A recent change in firefighter safety policy has restricted NRS personnel from being present within certain portions of Eglin with high UXO possibility while fire is on the ground. The risk of UXO potentially in or on the ground in these no suppression and restricted suppression areas was deemed sufficient to require modified burning and suppression tactics to lower UXO explosion potential (Table 4-1).

Table 4-1. No Suppression, Restricted Suppression, and Biologically Sensitive Areas

No Suppression	Due to a high level of contamination from UXO and shrapnel, several target areas including B-7, A-77, A-78, B-82, the "rice patties" area of B-70 and much of C-52 have been identified as "no suppression zones." Suppression activities will generally be replaced with a monitoring strategy until the fire can be declared out.
Restricted Suppression	Plows will not be used off of range roads for fireline construction except in extreme conditions and with the approval of the WFPM, the Natural Resources Manager, or their designee. Fire operations are limited in the restricted suppression zones due to elevated risk of UXO.
Biologically Sensitive Areas	To prevent ecosystem degradation from the modification of hydrology and vegetative damage, plows will not be used off of range roads for fireline construction except in extreme conditions and with the approval of the WFPM, the Natural Resources Manager, or their designee. Other biologically sensitive areas where plow operations are generally not conducted include seepage slopes, isolated wetlands, steepheads, high quality natural areas, and threatened and endangered species habitat. If wildfire conditions are such that plowed lines are deemed necessary in these areas, the WFPM, Assistant WFPM, Chief of Natural Resources, or their designee(s) will approve the use and location of the lines.

WFPM: Wildland Fire Program Manager; UXO: unexploded ordnance

Within the no and restricted suppression areas, monitors cannot be present within the fire perimeter while fire is on the ground, and no observation of trees can be conducted until after the fire is certified to be out (usually several hours after the fire has passed the area). Although this constraint is small, it increases the potential for direct physical harm and harassment should fire

Effects Determination***Federally Listed Species***

reach the cavity and/or damage the tree. To minimize potential impacts in these clusters, pre-fire preparation may be extended out further from the tree or fire resistant foam or water may be applied on or around the tree prior to fire being set. All cavity trees in these areas will be checked immediately following the fire to assess damage and to determine the need for replacement cavities. If a cavity tree is destroyed in a prescribed fire, Eglin NRS would replace any cavity tree damaged to the point it is unsuitable for nesting or roosting within 72 hours with a box insert. Roost checks would not be conducted since it would be undetermined which bird would have been using the tree anyway. Eglin NRS would conduct a roost check and visually inspect the cavity if during a night burn the fire burned up through the cavity. Additionally, the majority of the areas in the no and restricted suppression areas are burned annually, which decreases the fuel load so that fires are generally not damaging to the trees (Figure 2-2).

The increasing tempo and extent of ground training operations has already begun to limit access to certain burn blocks for large periods of the year. To effectively maintain these habitats with prescribed fire, additional adjustments for fire management will be required. One of these changes will be an increase in nighttime prescribed burning to meet acreage goals for habitat restoration. Night fires do not tend to burn as hot due to higher humidity and lower winds, thus reducing the likelihood of tree ignition. However, there is an increased risk of harassment for any cavity tree that does ignite because RCWs would be roosting in their cavity trees at night. Although the NRS believes the risk is small for direct impact, night burning may result in harassment to RCWs. As described previously, cavity tree preparation will be done and RCW monitors will be present for nighttime burns to reduce the potential for damage to trees or harassment to roosting RCWs.

During the previous Eglin INRMP Section 7 consultation, the USFWS concurred with Eglin's "not likely to adversely affect" determination for the RCW (U.S. Air Force, 2002; USFWS, 2002). Although fire-related cavity tree kill has been limited during the past 10 years due to high fire frequency and thorough pre-burn cavity tree preparation activities, the recent change in policy with the no and restricted suppression areas has prompted the NRS to reconsult. The planned increase in nighttime burning is also a consideration due to the increased risk of harassment and direct harm to RCWs. Eglin NRS fire managers and wildlife biologists that have over 10 years of experience prepping, burning, and monitoring believe that up to 12 active RCW cavity trees may be impacted annually, and that birds within those 12 trees may be harassed and/or harmed. Table 4-2 identifies the number of active RCW trees within the no suppression and restricted suppression areas per historical burn frequency. There are currently four active RCW trees within the no suppression area and 181 active RCW trees within the restricted suppression area. Out of the 1,901 total active trees known on Eglin AFB, 185 fall within the no and restricted suppression areas. Eleven active trees within both no and restricted suppression areas have not had prescribed burning in over 10 years. Prescribed fire activities are **LIKELY TO ADVERSELY AFFECT** individual RCWs and RCW cavity trees; however, cavity tree preparation and tree monitors will reduce the likelihood of impact. Prescribed fire will have an overall **BENEFICIAL EFFECT** on RCW foraging habitat and is an essential component of management of the species.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-3

Effects Determination

Federally Listed Species

Table 4-2. Prescribed Fire Frequency and Active RCW Trees Within the No Suppression and Restricted Suppression Areas

Prescribed Fire Frequency*		Number of Active RCW Trees	
		No Suppression Area	Restricted Suppression Area
		4**	181**
	1 year	0	84
	5 year	0	174
	10 year	0	174
	10+ years	4	7

*Does not include wildfires

**Total active trees within area

Wildfire Support. While wildfires may sometimes provide beneficial results in fire-adapted habitats, they just as easily can cause damage if they burn under extreme conditions; thus, prescribed fire is the preferred method for managing RCW foraging habitat in the sandhills and flatwoods of Eglin. This Wildfire Support section only analyzes the impacts of NRS wildfire support activities; impacts from the wildfire itself require separate analysis, and must be covered in mission-related PBAs and the Recreation Management section of this BA. With the bed-down of the 7SFG(A), increase in strafing missions from JSF, and the return of AFSOC troops from theater, mission-caused wildfires are estimated to increase to approximately 140 wildfire starts a year (Table 2-2). Eglin NRS actively protects active cavity trees during a wildfire. This protocol is detailed in the WFMP.

Suppression techniques range from full, direct line construction to a block and burn containment strategy depending on fuel, mission, and other installation fire activity. As described above, safety considerations have led to an increase in the acreage of “no suppression” and “restricted suppression” areas (Table 4-1, Figure 2-2). Military mission activity often precludes the use of aircraft for fire suppression activities, and UXO concerns in the no and restricted suppression areas typically require firefighters to use indirect methods of attack, pulling back to safe areas and conducting burn out operations from those areas. This is referred to as “block and burn” suppression, meaning that the fire is attacked indirectly by using roads and/or other pre-existing boundaries to contain the fire. This management technique improves firefighter safety, but also increases the risk of larger and more intense wildfires.

Restriction of access to no and restricted suppression areas while active fire is on the ground limits the ability of firefighters to protect RCW cavity trees within these areas. Direct impacts would be similar to prescribed burns as described above in the sense that RCW monitors would not be allowed in the area to protect trees during active fire, and in some cases trees may not have been prepped. However, depending on the conditions of the fire, not all wildfires are damaging, and some wildfires may actually result in beneficial impacts for some areas.

To minimize damaging wildfires in areas with high wildfire potential, the NRS prioritizes most no suppression areas for annual burning. Most of the no suppression areas are near Test Areas A-77, A-78, A-79, and B-7 (Air to Ground Gunnery ranges). For the *Air to Ground Gunnery Section 7 Consultation* (FWS No. 4-P-04-249), USFWS concurrence was predicated on Eglin’s agreement to follow certain avoidance and minimization measures, summarized here:

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-4

Effects Determination**Federally Listed Species**

- To decrease the intensity of fires, maintain a two-year burn return interval around A-77, A-78, A-79, and B-7
- Prep RCW cavity trees prior to prescribed burning operations
- Replace any cavity tree damaged by fire to the point it is unsuitable for nesting or roosting with an artificial cavity within 72 hours of the damage.

These areas are now designated as “no suppression burn annually” areas to minimize the potential for damage to RCW trees from intense wildfires (Figure 2-2).

New restrictions on wildfire suppression may result in impacts to RCWs and/or active RCW trees; however, impacts from the actual wildfire must be addressed separately in mission-specific consultations, and in the Recreation Management section. Wildfire support activities themselves are NOT LIKELY TO ADVERSELY AFFECT the RCW, and may serve to reduce impacts to trees that are protected from damaging wildfire. Block and burn techniques of wildfire control may result in BENEFICIAL EFFECTS for some areas if fire conditions are right.

Forest Management. One of the main goals of Forest Management is to restore the longleaf pine ecosystem to recover T&E species in the CCA. However, while Eglin Forestry takes every precaution to prevent a mishap, impacts may occur due to unforeseen events involving heavy equipment, or when conducting activities like sand pine eradication, slash pine plantation removal, thinning, chopping for site preparation, and longleaf plantings. To avoid the potential for behavioral impacts to RCWs, mechanized equipment would not be used within an RCW cluster during nesting season.

Hardwood control for TSI, use of herbicides for site preparation, and other forestry uses of chemicals to control vegetation may affect RCW. However, these activities would follow requirements from the *Long-term Vegetation Control (LVC) BA* and *Hexazinone Application on Interstitial Areas* consultation would be followed (U.S. Air Force, 2007a; U.S. Air Force, 2001). With the implementation of LVC BA and *Hexazinone BA* requirements, forest management activities are NOT LIKELY TO ADVERSELY AFFECT the RCW, and would have an overall BENEFICIAL EFFECT.

Habitat Restoration. Although invasive non-native plant species control and erosion control projects have an overall beneficial impact, these restoration activities may also cause localized, short term negative impacts in surrounding habitats, and may affect non-target individual animals. Erosion control actions near RCWs and RCW foraging habitat have the potential to disturb RCWs; however, all of these actions are coordinated internally at Eglin NRS between forestry and wildlife elements to lessen any potential impacts from earth moving or planting.

Removal of invasive non-native plant species results in improvements in native biodiversity and ecosystem functioning, and benefits multiple sensitive species including the RCW. However, invasive non-native plant species treatments utilizing herbicides have the potential to impact RCWs foraging resources and human presence could disturb birds. Eglin would follow the requirements of the LVC BA (U.S. Air Force, 2007a) to minimize potential disturbance to birds and minimize effects to non-target resources from herbicides. With the implementation of LVC

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-5

Effects Determination***Federally Listed Species***

BA requirements, habitat restoration activities are NOT LIKELY TO ADVERSELY AFFECT the RCW, and would have an overall BENEFICIAL EFFECT.

Ecological Monitoring. Ecological monitoring requires personnel to actively work within some RCW clusters thus human presence may disrupt normal foraging activities for the RCW. However, this is considered minor behavioral disturbance and no habitat impacts are anticipated during monitoring activities. Biologists involved with ecological monitoring are familiar with the sensitive species and habitats present within their study areas, and adjust activities and timing as needed to avoid impacts. Ecological monitoring is NOT LIKELY TO ADVERSELY AFFECT the RCW, and would have an overall BENEFICIAL EFFECT because it provides managers with data to make fire and forestry adaptive management decisions.

Protected Species Management and Monitoring. Management and monitoring for the RCW may directly impact the RCW due to cavity insertions, translocation, and behavioral modification during monitoring. These actions are PERMITTED; therefore, RCW management and monitoring are not directly addressed in this BA.

Recreation Management. Hunting and non-consumptive outdoor recreation such as hiking has the potential to disturb RCWs and cause wildfires. However, the majority of hunting seasons occur outside of RCW nesting season, and NRS biologists have not noted any major issues with hunting within RCW foraging habitat at Eglin AFB in the past 15 years (Johnson and Gault, 2012). Unauthorized activities may potentially affect RCWs (i.e., accidental or intentional wildfires set by recreational users could damage RCW cavity trees and harass birds); however, this is not the action of the NRS and, thus, is not included in this biological assessment. Eglin AFB is currently evaluating and implementing new measures for public access across the range. Additional conservation law enforcement would likely deter recreationists from such unauthorized activities. Recreation management is NOT LIKELY TO ADVERSELY AFFECT the RCW.

RCW Summary

The Proposed Action has the potential to impact the RCW from direct physical impacts, noise and human presence, and habitat impacts associated with prescribed fire, forest management, and recreation management. Cumulatively, these stressors have the potential to negatively affect certain RCW clusters. Recent changes with the no and restricted suppression areas and nighttime burning increase the risk for harassment of individuals and potential loss of cavity trees throughout the reservation, but especially in the no and restricted suppression areas. Eglin NRS believe that 12 active RCW cavity trees are likely to be impacted annually, and that birds within those 12 trees may be harassed and/or harmed. Prescribed fire activities are LIKELY TO ADVERSELY AFFECT individual RCWs and RCW cavity trees; however, Eglin would implement Conservation Measures as part of the Proposed Action to decrease potential for impacts to the RCW and prescribed fire will have an overall BENEFICIAL POPULATION EFFECT. All other NRS activities are NOT LIKELY TO ADVERSELY AFFECT the RCW and RCW habitat.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-6

Effects Determination

Federally Listed Species

4.1.2 Sea Turtles

The following activities do not occur on the beaches at SRI or CSB, thus would have NO EFFECT on sea turtles: prescribed fire, wildfire support, forest management, habitat restoration, and ecological monitoring.

Nuisance and Non-native Animal Management. Although beach predator control efforts may involve habitat disturbance from foot traffic, these activities are NOT LIKELY TO ADVERSELY AFFECT sea turtles, as personnel would avoid nesting areas and use of lights at night would be very minimal. Overall, predator control would have a BENEFICIAL EFFECT for sea turtles through reduction in predation on eggs and hatchlings.

Protected Species Management and Monitoring. NRS is PERMITTED through the ESA Section 10(A)1(a) permitting process to conduct species monitoring and nest evaluations for sea turtles on Eglin property, thus potential impacts from monitoring are not analyzed. NRS is also approved to conduct relocations under various mission-related consultations, thus relocations are not discussed in this BA. Impacts from monitoring and posting habitat for other species such as shorebirds would be minimal as personnel would avoid nesting areas and would not conduct activities at night during nesting season. Monitoring and management for other protected species is NOT LIKELY TO ADVERSELY AFFECT sea turtles, and posting and screening of turtle nests would have a BENEFICIAL EFFECT by reducing predation and encouraging nest avoidance by people on the beach.

Recreation Management. Non-consumptive recreation and fishing on the public access portions of SRI and CSB and beach driving at CSB may negatively affect sea turtles through dune degradation, nest disturbance/destruction, human presence, and disorientation or misorientation of nesting adults and hatchlings due to lights. Impacts could be minor to severe depending on the number and frequency of human encounters with turtles. To minimize these impacts at SRI, the NRS posts signs of recreational hours at official beach access points, as well as at sea turtle nests for avoidance at both SRI and CSB. Sand dune sledding, night camping, and campfires are restricted on SRI and CSB beaches. Potential impacts to sea turtles from recreation were analyzed in the 2002 INRMP BA. Conservation measures should minimize impacts from authorized recreational activities (i.e., walking, fishing); recreation may affect but is NOT LIKELY TO ADVERSELY AFFECT sea turtles on the 4 miles of Eglin **SRI** beaches open to public access.

Eglin has installed a gate on the eastern boundary at CSB to restrict access to Eglin beaches at night during sea turtle season. Beach driving is allowed (with a permit from Gulf County) during daylight hours on a non-interference basis, but is prohibited on Eglin AFB property at CSB after sunset from May 1 through October 31 to prevent interference with turtle nesting. Eglin has also instituted a program of rut removal before sunset when nests are close to hatching to avoid stranding of hatchlings. These conservation measures should prevent impacts from nighttime CSB beach driving, while daytime beach driving and other recreational activities (i.e., walking, fishing) may affect but are NOT LIKELY TO ADVERSELY AFFECT sea turtles on the 3 miles of Eglin **CSB** beaches.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-7

Effects Determination

Federally Listed Species

4.1.3 Reticulated Flatwoods Salamander

The following activities would have NO EFFECT on the reticulated flatwoods salamander: coastal species and habitat management and monitoring. In terms of avoidance and minimization of impacts, NRS provides *potential* salamander habitat with the same level of protection as *known* habitat.

Prescribed Fire. Under the INRMP, NRS would maintain approximately 17,000 acres of flatwoods salamander habitat using prescribed fire on a three year rotation to keep woody vegetation at appropriate levels. In the final rule for listing of the salamander, prescribed fire conducted in accordance with recommended timber management practices is an action that is not likely to adversely affect flatwoods salamanders (Federal Register, 1999); NRS will continue to follow these guidelines. Additionally, for necessary firebreaks along the urban interface within wetland areas, a low ground pressure Positrac tracked vehicle would be used for mowing and work would be done during dry periods in accordance with requirements from the *Gyrotrack Section 7 consultation* (U.S. Air Force, 2003). Fire crews will be briefed on protection of flatwoods salamander habitat prior to and during the fire season. Prescribed fire activities are NOT LIKELY TO ADVERSELY AFFECT the flatwoods salamander, and would have overall BENEFICIAL IMPACTS for the population.

Wildfire Support. Wildfire suppression activities and the associated use of heavy equipment in wetland areas may negatively affect the flatwoods salamander through modification of hydrology and vegetative damage. However, depending on the conditions of the fire, not all wildfires are damaging, and some wildfires may actually result in beneficial impacts for some areas. As a protective measure, flatwoods salamander ponds and buffers are included as part of the biologically sensitive areas shown on the limited suppression map (Figure 2-2), thus plows are not used off of range roads for fire suppression except in extreme conditions within these sensitive areas. Fire crews will be briefed on protection of flatwoods salamander habitat prior to and during the fire season.

The following activities would only be conducted under emergency conditions: tying fire lines into ponds, plowing fire line in or around ponds, using foam in or around ponds. NRS would conduct an incident report with a detailed description of activities to extinguish fire and rehab the impacted areas. Although wildfire support activities may negatively affect flatwoods salamanders, these impacts would not be significant. Other than extreme emergency situations, wildfire suppression activities are NOT LIKELY TO ADVERSELY AFFECT the flatwoods salamander. Eglin would conduct an incident report if suppression damage were to occur during extreme wildfire conditions. Block and burn techniques of wildfire control may result in BENEFICIAL EFFECTS for some areas if fire conditions are right.

Forest Management. Forest management activities may create potential impacts by changing the structure of salamander habitat in localized areas. However, these changes would be short-term in nature, with the end result being a return to a more natural vegetative structure. Any timber harvesting or forestry activities conducted in pine flatwoods habitat occurring within 1,500 feet of potential and known flatwoods salamander breeding ponds will be conducted according to the *Recommended Timber Management Practices for the Flatwoods Salamander* (Federal Register, 1999). Thus, forest management activities are NOT LIKELY TO

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-8

Effects Determination***Federally Listed Species***

ADVERSELY AFFECT the flatwoods salamander and in some situations would result in BENEFICIAL IMPACTS.

Habitat Restoration. The use of herbicides for INPS and hardwood control in salamander ponds has the potential for adversely impacting the quality of wetland areas, which are used by flatwoods salamanders for breeding. To minimize potential impacts, NRS will follow requirements in the LVC BA (U.S. Air Force, 2007a) and *Hardwood Thinning BA* (USFWS, 2008), such as completing work outside of breeding season (October to December). Thus, treatment of INPS and hardwoods is NOT LIKELY TO ADVERSELY AFFECT the flatwoods salamander, and would result in BENEFICIAL EFFECTS to the population through overall improvements in its habitat.

Nuisance and Non-native Animal Management. Within flatwoods and wetland habitats feral hogs can uproot vegetation and disturb soils, destroying these sensitive habitats essential for salamanders. Feral hog control under the INRMP would have BENEFICIAL EFFECTS to the reticulated flatwoods salamander.

Ecological Monitoring and Protected Species Management and Monitoring. NRS is PERMITTED to conduct species monitoring for the flatwoods salamander. Ecological monitoring of flatwoods habitat would have BENEFICIAL EFFECTS for the reticulated flatwoods salamander through improved understanding of management effects on flatwoods habitats.

Recreation Management. Non-consumptive outdoor recreation may negatively impact the flatwoods salamander due to unauthorized off-road driving, accidental or intentional wildfires, and insufficient conservation law enforcement in flatwoods salamander habitats. Off-road driving and ATV use can alter hydrology, cause sedimentation issues, and result in ruts that affect the ability of salamanders to migrate between ponds and upland habitats. Accidental or intentional wildfires can kill salamanders and trees, and result in damaging wildfire suppression activities. Conservation law enforcement to address these issues is currently insufficient. However, as problem areas are identified, the NRS will implement restricted access controls in these areas to reduce the potential for habitat destruction. Recreation management is NOT LIKELY TO ADVERSELY AFFECT the reticulated flatwoods salamander.

4.1.4 Okaloosa Darter

The following activities would have NO EFFECT on the Okaloosa darter: coastal species and habitat management.

Prescribed Fire. Prescribed fire activities and the associated use of heavy equipment in riparian areas have the potential to negatively affect the Okaloosa darter through modification of hydrology and vegetative damage. However, fire lines are primarily on established roads within riparian areas around Okaloosa darter streams. Additionally, the special rule 4(d) allows take during prescribed fire activities that are consistent with the Eglin INRMP (Federal Register, 2011), therefore prescribed fire activities are COVERED UNDER THE SPECIAL RULE 4(d).

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-9

Effects Determination***Federally Listed Species***

Wildfire Support. Wildfire suppression activities and the associated use of heavy equipment in riparian areas may affect the Okaloosa darter through the modification of hydrology and vegetative damage. However, darter riparian areas are included as part of the biologically sensitive areas shown on the limited suppression map (Figure 2-2); plows are not used off of range roads for fireline construction except in extreme conditions within these areas. Any damage to streams and stream banks would be repaired in coordination with the USFWS. Eglin would conduct an incident report with a detailed description of activities to extinguish fire and rehab the impacted areas if suppression damage were to occur during extreme wildfire conditions. Other than extreme emergency situations, wildfire suppression activities are NOT LIKELY TO ADVERSELY AFFECT the Okaloosa darter.

Forest Management. Although forest management may involve activities that create the potential for short-term and localized nominal erosion into darter streams, NRS follows *Silvicultural BMPs for Florida* (FDACS, 2011) to minimize this potential. Herbicide use would follow requirements in the LVC BA (U.S. Air Force, 2007a). As a result, forest management activities are NOT LIKELY TO ADVERSELY AFFECT Okaloosa darters. Additionally, longleaf plantings will help to stabilize soils and minimize erosion, resulting in a BENEFICIAL EFFECT for the Okaloosa darter.

Habitat Restoration. Erosion control and improvement of water quality and fish passage are the primary goals of the NRS erosion control program in Okaloosa darter watersheds. Methods include earth moving and planting to stabilize slopes adjacent to darter streams. The final rule down-listing the Okaloosa darter incorporates a special rule under Section 4(d) of the ESA that details allowable take for certain actions that have the scope and purpose to improve darter habitat, including in-stream habitat restoration, unpaved range road stabilization, and removal or replacement of culverts for the purpose of road decommissioning, improving fish passage or enhancing stream habitat. Erosion control and fish passage projects at Eglin are COVERED UNDER THE 4d RULE, and have an overall BENEFICIAL EFFECT to the darter and its habitat.

Herbicide use for INPS has the potential for adversely impacting water quality. However, the use of these herbicides will follow requirements in the LVC BA (U.S. Air Force, 2007a). As a result, herbicide use is NOT LIKELY TO ADVERSELY AFFECT the Okaloosa darter and would have an overall BENEFICIAL EFFECT.

Nuisance and Non-native Animal Management. Feral hogs on Eglin exacerbate erosion problems by rooting in riparian areas and causing significant ground and soil disturbance, thereby creating the potential for sediment to move easily to surface waters via overland flow from large storm events. Feral hog removal prevents such damage. The NRS also conducts beaver control as necessary to protect road assets and to restore natural hydrology on Okaloosa darter streams. Beaver stream impoundments alter normal darter movements and modify specific stream hydrological conditions required for darter habitat. Beaver management would prevent impoundment and other alterations to stream characteristics which would negatively impact Okaloosa darters. Feral hog and beaver control have BENEFICIAL EFFECTS for Okaloosa darters.

Effects Determination

Federally Listed Species

Ecological Monitoring and Protected Species Management and Monitoring. NRS and its contractors (U.S. Geological Survey) are PERMITTED to conduct species monitoring for the Okaloosa darter. Ecological monitoring activities in aquatic systems involve physical, chemical, and biological sampling of stream habitat and water quality. While these activities may result in temporary habitat disturbance or direct physical impact to darters, these monitoring activities are consistent with an approved Okaloosa darter recover plan, thus are COVERED UNDER THE 4d RULE. Overall, aquatic habitat and water quality monitoring in darter streams would result in a BENEFICIAL EFFECT to the species, as NRS would be able to detect changes in populations that may require direct management activities based on monitoring data.

Recreation Management. Recreation management has the potential to impact the Okaloosa darter through increased sedimentation and altered hydrology. Bare soil exposed during the creation of supplemental food plots could cause sedimentation; however, NRS will utilize best management practices, such as maintaining vegetative buffer strips along riparian areas to minimize potential runoff impacts to streams. Due to the small size of the darter and the streams they inhabit, fishing activities are not likely to negatively impact darters.

Non-consumptive outdoor recreation poses potential impacts associated with public disregard of signs indicating areas of avoidance. Erosion and hydrologic alteration may occur when unauthorized off-road driving occurs in riparian areas and across streams; however, this occurrence is uncommon, and any issues discovered are addressed with access controls. Fish pond management and recreation at Anderson Pond may affect the Okaloosa darter downstream from the pond. Typical levels of recreational use are unlikely to damage riparian vegetation, but concentrated traffic (i.e., if the Youth Fishing Rodeo is moved to this site), there would be the potential for erosion issues if riparian vegetation were trampled. To minimize this, NRS personnel would be present at the rodeo to keep participants out of sensitive areas. Although not presently occurring, if aquatic weed control became necessary then the NRS would conduct a separate consultation to address impacts. As a result, recreation management is NOT LIKELY TO ADVERSELY AFFECT the Okaloosa darter. Beaver control would have BENEFICIAL EFFECTS for the Okaloosa darter by restoring the free-flowing nature of streams that were impounded by beaver dams.

4.1.5 Eastern Indigo Snake

The following activities would have NO EFFECT on the indigo snake: coastal species and habitat management, and protected species management and monitoring. Gopher tortoise and indigo snake surveys and relocations follow requirements in the *Programmatic Indigo Snake Biological Opinion* (USFWS, 2009), thus are not discussed in this analysis.

Prescribed Fire, Wildfire Support, Forest Management, and Habitat Restoration. These activities have the potential to impact individual indigo snakes through temporary habitat disturbance and incidental contact with equipment. However, encounters with snakes during these activities would be extremely rare given the scarcity of this species on Eglin, combined with the snake's ability to escape from heavy equipment. Additionally, these management actions (with the exception of wildfire support) will benefit the overall population of indigo snakes on Eglin AFB through habitat maintenance and restoration. NRS will minimize the potential for negative impacts by following the Terms and Conditions from the *Programmatic*

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-11

Effects Determination**Federally Listed Species**

Indigo Snake Biological Opinion (USFWS, 2009). Additionally, if an indigo snake was encountered during management activities, personnel would stop and allow the snake to move to safety before proceeding. Wildlife biologists would be notified immediately to document the individual. Herbicide use for invasive non-native plant species control and site preparation has the potential to impact the indigo snake through incidental contact. To minimize the potential for these impacts, applicators will follow requirements in the LVC BA (U.S. Air Force, 2007a).

Prescribed fire, wildfire support, forest management, and habitat restoration are NOT LIKELY TO ADVERSELY AFFECT the indigo snake, and these activities would have an overall BENEFICIAL EFFECT through overall improvement of its natural habitat.

Ecological Monitoring. Monitoring of sandhills and flatwoods habitat is passive in nature, and provides important information to inform future habitat management decisions. Consequently, ecological monitoring would have an overall BENEFICIAL EFFECT for the indigo snake through improved habitat management.

Recreation Management. The creation and maintenance of food plots, while potentially modifying snake habitat, is unlikely to affect the indigo snake, as these areas would represent only a small percentage of the total land designated as suitable habitat for the indigo snake. Although hunting, fishing, and non-consumptive recreational activities may impact the indigo snake through incidental direct physical impact, due to the rarity of this snake, chances of these occurrences are small. It is likely that the snake will avoid areas with humans present, and hikers and hunters walking through wooded areas would likely scare a snake away before getting near enough to trample it. As a result, recreation management is NOT LIKELY TO ADVERSELY AFFECT the indigo snake.

4.1.6 Gulf Sturgeon and Critical Habitat

The following activities would have NO EFFECT on the Gulf sturgeon or critical habitat: prescribed fire, protected species management, and hunting.

Wildfire Support. Wildfire suppression and the associated use of heavy equipment in riparian areas may affect the Gulf sturgeon and critical habitat due to erosion from firelines. However, Gulf sturgeon riparian areas are included as part of the biologically sensitive areas shown on the limited suppression map (Figure 2-2); plows are not used off of range roads for fireline construction except in extreme conditions within these areas. Eglin would conduct an incident report with a detailed description of activities to extinguish fire and rehab the impacted areas if suppression damage were to occur during extreme wildfire conditions, and any damage caused by firebreaks within the riparian area would be repaired in coordination with the USFWS. Other than emergency situations, wildfire suppression activities are NOT LIKELY TO ADVERSELY AFFECT the Gulf sturgeon.

Forest Management. Forest Management activities have the potential to impact the Gulf sturgeon and its critical habitat if exposed soil erodes into streams and rivers. To minimize the potential for erosion, Eglin forestry operations follow the *Silvicultural BMPs for Florida* (FDACS, 2011), which describes the practices that are acceptable or prohibited within the stream management zones, based soils and slope. During herbicide use for site preparation, Eglin would

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-12

Effects Determination**Federally Listed Species**

follow requirements in the *LVC Section 7 Consultation* (U.S. Air Force, 2007a). As a result, forest management activities under the INRMP are NOT LIKELY TO ADVERSELY AFFECT Gulf sturgeon individuals or critical habitat, and soil stabilization from plantings would have a BENEFICIAL EFFECT.

Habitat Restoration. Short-term sedimentation would be possible from earth-moving activities associated with erosion control restoration projects; however, NRS would employ erosion control measures during restoration activities. Thus, these activities are NOT LIKELY TO ADVERSELY AFFECT the Gulf sturgeon, and would have overall BENEFICIAL EFFECTS to the Gulf sturgeon and its critical habitat through improved water quality along the Yellow and Shoal rivers, East and Choctawhatchee bays, and Santa Rosa Sound.

Herbicide use during INPS control efforts would follow requirements in the *LVC Section 7 Consultation* (U.S. Air Force, 2007a), thus INPS control is NOT LIKELY TO ADVERSELY AFFECT the Gulf sturgeon.

Nuisance and Non-native Animal Control. Feral hogs on Eglin exacerbate erosion problems by rooting in the ground and causing significant ground and soil disturbance, thereby creating the potential for sediment to move easily to surface waters via overland flow from large storm events. Feral hog removal prevents such damage, thus has BENEFICIAL EFFECTS for Gulf sturgeon.

Ecological Monitoring. Monitoring of riverine habitats would have BENEFICIAL EFFECTS for the Gulf sturgeon through improved knowledge of water and habitat quality.

Protected Species Monitoring. Sturgeon monitoring is PERMITTED through the USFWS.

Recreation Management. While there may be incidental interaction with the sturgeon by anglers and recreationists, fishing activities and non-consumptive outdoor recreation (i.e., canoeing) activities are NOT LIKELY TO ADVERSELY AFFECT the Gulf sturgeon or its critical habitat.

4.1.7 Piping Plover and Piping Plover Critical Habitat

The following activities would have NO EFFECT on the piping plover or its designated critical habitat: prescribed fire, wildfire support, forest management, and ecological monitoring. INPS control would not occur unless the INPS was deemed a direct threat to plover critical habitat; a separate consultation would be prepared prior to treating vegetation.

Nuisance and Non-native Animal Management. Although beach predator control efforts may involve habitat disturbance from foot traffic, these activities are NOT LIKELY TO ADVERSELY AFFECT piping plover or piping plover critical habitat, as personnel would avoid critical habitat areas. Overall, predator control would have a BENEFICIAL effect for piping plovers through reduction in predation.

Protected Species Management and Monitoring. Monitoring and posting activities for plovers and shorebirds may temporarily flush the birds from the area, possibly causing stress, but birds

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-13

Effects Determination**Federally Listed Species**

would be expected to simply move on to undisturbed foraging areas during the course of the activity and return to the area once the general disturbance is over. Disturbance would be temporary and localized in nature, so these activities would cause minimal harassment and no direct impacts are expected. Monitoring and posting activities are NOT LIKELY TO ADVERSELY AFFECT the piping plover or piping plover critical habitat, and would have an overall BENEFICIAL EFFECT improved plover location information and habitat protection.

Recreation Management. Unauthorized access to plover habitat by recreational users may cause birds to temporarily flush from the area, and could damage critical habitat. For piping plovers and piping plover critical habitat on **CSB**, potential impacts could vary depending on the number and frequency of vehicle or human encounters with plovers on the CSB beach, which is open to public recreation, including beach driving. Potential piping plover areas on CSB are posted in order to prevent people and vehicles from disturbing foraging and roosting behaviors. Vehicles would cause some rutting within the beach area, but as vehicles are not permitted to drive in posted protected roosting areas (dunes) and must drive above the intertidal/saturated areas of the beach (two of the piping plovers primary constituent elements), the disturbance to plover habitat would be minor. At **SRI**, piping plover critical habitat is located within the restricted access portion and the area is posted, but potential impacts may arise with public disregard of signs indicating areas of avoidance. Eglin will continue to post piping plover critical habitat for avoidance. Because disturbance would be temporary and localized in nature, these activities would cause minimal harassment to piping plovers and no direct impacts are expected. Therefore beach driving and other recreational activities (i.e., walking or fishing) may affect, but are NOT LIKELY TO ADVERSELY AFFECT the piping plover and NOT LIKELY TO ADVERSELY MODIFY piping plover critical habitat at CSB or SRI.

4.1.8 Florida Perforate Lichen

The following activities would have NO EFFECT on *Cladonia*: prescribed fire, wildfire support, forest management, and ecological monitoring. INPS control would not occur unless the INPS was deemed a direct threat to the lichen; a separate consultation would be prepared prior to treating vegetation.

Nuisance and Non-native Animal Management. Predator control would not occur within *Cladonia* habitat, and posting should keep control personnel out of these areas, thus predator control is NOT LIKELY TO ADVERSELY AFFECT *Cladonia*.

Protected Species Management and Monitoring. Posting around lichen habitats would be maintained on an as-needed basis, but at least annually, to discourage access to the areas. Monitoring of *Cladonia* habitat is completed every 5 years or immediately following a significant storm event, and is conducted in accordance with protocols in the *Eglin Threatened and Endangered Species Plan*; monitoring would follow requirements in the protocol to protect *Cladonia*. Therefore posting and monitoring of *Cladonia* habitat are NOT LIKELY TO ADVERSELY AFFECT *Cladonia* habitat, and would have an overall BENEFICIAL EFFECT through habitat protection and increased location information.

Recreation Management. Non-consumptive outdoor recreation poses potential impacts associated with public disregard of signs and posting indicating areas of avoidance. *Cladonia*

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-14

Effects Determination

Federally Listed Species

habitat is posted on an as-needed basis, but at least annually, to discourage access to the areas. Thus continued non-consumptive outdoor recreation may affect, but is NOT LIKELY TO ADVERSELY AFFECT *Cladonia* habitat.

4.1.9 Freshwater Mussels

Wildfire Support. Heavy equipment use in riparian areas for wildfire suppression activities and forest management may affect freshwater mussels if exposed soil erodes into streams and rivers. However, mussel riparian areas are included as part of the biologically sensitive areas shown on the limited suppression map (Figure 2-2). Plows are not used off range roads for fire line construction except in extreme conditions within these areas. Any damage caused by firebreaks within the riparian area would be repaired in coordination with the USFWS. These activities are NOT LIKELY TO ADVERSELY AFFECT freshwater mussels.

Forest Management. Heavy equipment use in riparian areas for forest management actions may affect freshwater mussels if exposed soil erodes into streams and rivers. To minimize the potential for erosion from forestry operations, operators will follow the *Silvicultural BMPs for Florida* (FDACS, 2011), which describes the practices that are acceptable or prohibited within the stream management zones based on soils and slope. Herbicide use for INPS control and forestry site preparation has the potential for adversely impacting water quality. However, the use of these herbicides will follow requirements in the *LVC Section 7 Consultation* (U.S. Air Force, 2007a). Forestry activities are NOT LIKELY TO ADVERSELY AFFECT freshwater mussels.

Habitat Restoration. Short-term sedimentation would be possible from earth-moving activities associated with erosion control restoration projects; however, NRS would employ erosion control measures during restoration activities. Thus, these activities are NOT LIKELY TO ADVERSELY AFFECT freshwater mussels and would have overall BENEFICIAL EFFECTS through improved water quality due to soil stabilization.

Nuisance and Non-native Animal Control. Feral hogs on Eglin intensify erosion problems by rooting in the ground and causing significant ground and soil disturbance, thereby creating the potential for sediment to move easily to surface waters via overland flow from large storm events. Feral hog removal decreases such damage and, thus, has BENEFICIAL EFFECTS for freshwater mussels.

Ecological Monitoring. USFWS personnel stationed at Eglin's Natural Resources have begun to survey and monitor freshwater mussels on Eglin and the ecological indicators. All surveys and any direct contact with mussels would be performed by USFWS personnel, and permits associated with this work would be held by the USFWS. Monitoring of riverine habitats would have BENEFICIAL EFFECTS for freshwater mussels through improved knowledge of water and habitat quality.

Protected Species Monitoring. Freshwater mussel monitoring is permitted through the USFWS. Monitoring of riverine habitats would have BENEFICIAL EFFECTS for freshwater mussels through improved knowledge of water and habitat quality.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-15

Effects Determination

Other Species Considered

4.2 OTHER SPECIES CONSIDERED**4.2.1 Gopher Tortoise**

Many of the natural resources management activities that provide long-term habitat benefits also have the potential to cause temporary habitat disturbance and incidental contact with equipment, including prescribed fire, wildfire support, forest management, habitat restoration, ecological monitoring, and food plot maintenance activities. While it is possible that vehicles could crush an individual tortoise, burrow or egg clutch during NRS activities, this risk is minimized by the fact that vehicle activity will be limited for the most part to established roads and trails. "Stumping operations" are allowed only in areas of proposed roads, facilities and planned construction. Efforts are also made to reduce groundcover degradation by reducing the amount of high-intensity site prep for forest management operations. Single drum chopping is used whenever possible in pine plantations as opposed to bedding and root-raking.

To support certain missions or construction projects, the NRS may conduct gopher tortoise surveys and relocations. To minimize potential trauma to tortoises, the NRS would conduct these activities in accordance with FWC guidelines, and follow requirements in the *Indigo Snake Programmatic BO* (USFWS, 2009).

Historically, poaching of gopher tortoises has been a problem at Eglin, but current poaching rates are unknown. To minimize the potential for poaching Eglin does not provide location information on gopher tortoise burrows on its web viewer or in public documents. Other than keeping location information restricted, Eglin does not currently have any programs in place to prevent poaching.

In the event that a gopher tortoise or burrow is spotted during NRS activities, personnel will avoid the animal and burrow. Vehicle operators will be instructed to cease activity if a gopher tortoise is sighted, and wait until the tortoise is out of harm's way before resuming activity. Thus, overall impacts to the gopher tortoise from the Proposed Action would not be significant.

4.2.2 Florida Bog Frog

Prescribed fire and wildfire suppression activities and the associated use of heavy equipment in riparian areas have the potential to negatively affect the Florida bog frog through modification of hydrology and vegetative damage. However, plows are not used off of range roads for fire line construction except in extreme conditions within riparian areas around bog frog streams. Any damage to streams and stream banks would be repaired. Additionally, by controlling hardwood invasion of the boggy areas along stream habitats, prescribed fire is beneficial to the bog frog.

Forest management activities have the potential to impact bog frogs if exposed soil erodes into the boggy habitats along bog frog streams. To minimize the potential for erosion, Eglin would continue to follow the *Silvicultural BMPs for Florida* (FL Department of Agriculture, 2011) which describes the practices that are acceptable or prohibited within the stream management

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-16

Effects Determination**Other Species Considered**

zones, based on soils and slope. As a result, forestry management activities under the INRMP would not significantly impact the Florida bog frog.

Erosion control activities for restoration may temporarily affect the Florida bog frog during earth moving activities adjacent to streams. However, erosion control activities would have an overall beneficial effect on the Florida bog frog and its habitat. Herbicide use near the bog frog streams would follow management guidelines from the LVC BA (U.S. Air Force, 2007a).

Overall, the Proposed Action would not significantly impact the Florida bog frog.

4.2.3 Florida Burrowing Owl

Prescribed burning and wildfire support have the potential to impact individual burrowing owls and their burrows through temporary habitat disturbance and incidental contact with equipment. While it is possible that vehicles could crush an owlet, burrow or egg clutch, this risk is minimized by the fact that vehicle activity will be limited for the most part to established roads and trails. In the event that a burrow is spotted, personnel will avoid the burrow.

Monitoring and posting of burrowing owl burrows would likely temporarily flush the owls from the area, possibly causing stress, but the owls would be expected to simply move on to undisturbed areas during the course of the activity and return to the area once the general disturbance is over. Therefore, management and monitoring activities would not have a significant impact on the burrowing owl.

Overall, the Proposed Action would not significantly impact the Florida burrowing owl.

4.2.4 Bald Eagle

In accordance with the National Bald Eagle Management Guidelines (USFWS, 2007) a primary zone of 330 feet has been established around nesting trees so that direct physical impacts can be avoided by forestry activities. No forestry activities would take place within the 330-foot buffer zone during the nesting season (October 1 – May 15). Additionally, any impacts associated with noise disturbance would be of an intermittent, temporary nature, and would not pose any long-term impacts to the species.

Areas around known bald eagle nests have the potential to be treated for INPS. Treatment of INPS within the buffer would only occur outside of the nesting season (October 1 - May 15). Herbicide use would follow management guidelines from the Long-Term Vegetation Control Biological Assessment (Log No. 4-P-07-036).

Bald eagle monitoring involves observatory nest evaluations for eggs and hatchlings, which do not directly interact with the species. These activities would not have a significant impact on bald eagles frequenting the Eglin Mainland Reservation or Cape San Blas. In fact, these activities would provide beneficial effects through the update and maintenance of scientific data for the species that can be used in management decisions.

Fishing activities and non-consumptive outdoor recreation pose potential impacts associated with disturbance of nesting activities from human presence near the eagle's nesting tree. A posted

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-17

Effects Determination**Other Species Considered**

330 ft buffer on Main Base would serve to deter public access near the nest. Although the bald eagle nesting area is not currently posted at CSB, fishing activities and non-consumptive outdoor recreation are not likely to occur near eagle nesting habitat as the area is naturally inaccessible to the public. The buffer area would be posted if Natural Resource personnel noticed an increase in the public use of that area.

Overall, the Proposed Action would not have a significant impact on the bald eagle.

4.2.5 Santa Rosa Beach Mouse

Potential for impacts to the Santa Rosa beach mouse from predator control, and protected species management and monitoring activities is extremely low due to the fact that beach mice tend to spend much of their time in burrows that they excavate in the dunes. Established dunes and vegetated areas would be avoided as these areas function as habitat for beach mice, providing food and shelter. Even through numerous postings for sensitive species are erected each year, Eglin NRS cannot prevent all persons from entering these areas.

Overall, the Proposed Action would not significantly impact the Santa Rosa beach mouse.

4.2.6 Shorebirds

Although beach predator control efforts may involve habitat disturbance from foot traffic, these activities would not significantly impact shorebirds, as personnel would avoid shorebird nesting areas. Overall, predator control would have a beneficial effect for shorebirds through reduction in predation on nests and chicks.

During shorebird monitoring activities, shorebirds are likely to be flushed from the area but would be expected to return once the general disturbance is over. For shorebird area posting and monitoring for species other than shorebirds, personnel would be informed of where nesting shorebirds are located for avoidance.

Potential impacts from recreation would depend on the number and frequency of human encounters. It is likely the birds would flush from the area, possibly causing stress, but the birds would be expected to simply move on to undisturbed foraging areas during the course of the activity and return to the area once the general disturbance is over. Because disturbance would be temporary and localized in nature, these activities would cause minimal harassment to shorebirds and no direct impacts are expected. Nesting shorebird areas would be posted, however potential habitat impacts may arise with public disregard of signs indicating areas of avoidance.

Cape San Blas personnel conduct weekly shorebird surveys. Overall the Proposed Action would not significantly impact shorebirds at SRI or CSB.

4.2.7 Red Knot

During spring and fall migration, red knots have been documented on CSB. Personnel are currently collecting GPS data for the red knot (as well as all other shorebirds weekly), as it is a

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-18

Effects Determination**Other Species Considered**

candidate for federal listing (Figures 4-1 and 4-2). Data collected will provide information on habitat use for the species. This data will be important to preclude listing of critical habitat on Air Force property and will be documented in the T&E Species CP to ensure it would meet the requirements for critical habitat exemption. Red knot conservation measures will likely mimic the piping plover to protect areas that are frequently used. Overall, the Proposed Action would not significantly impact the red knot at SRI or CSB.

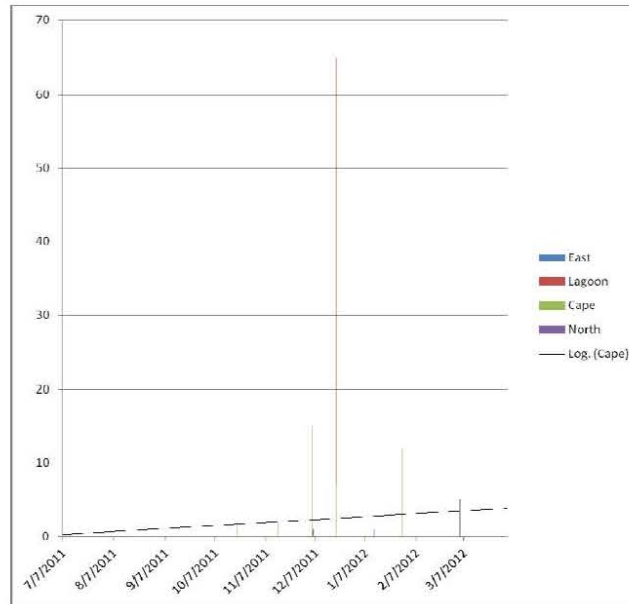


Figure 4-1. Number of Red Knots Sighted at Cape San Blas

Effects Determination

Other Species Considered

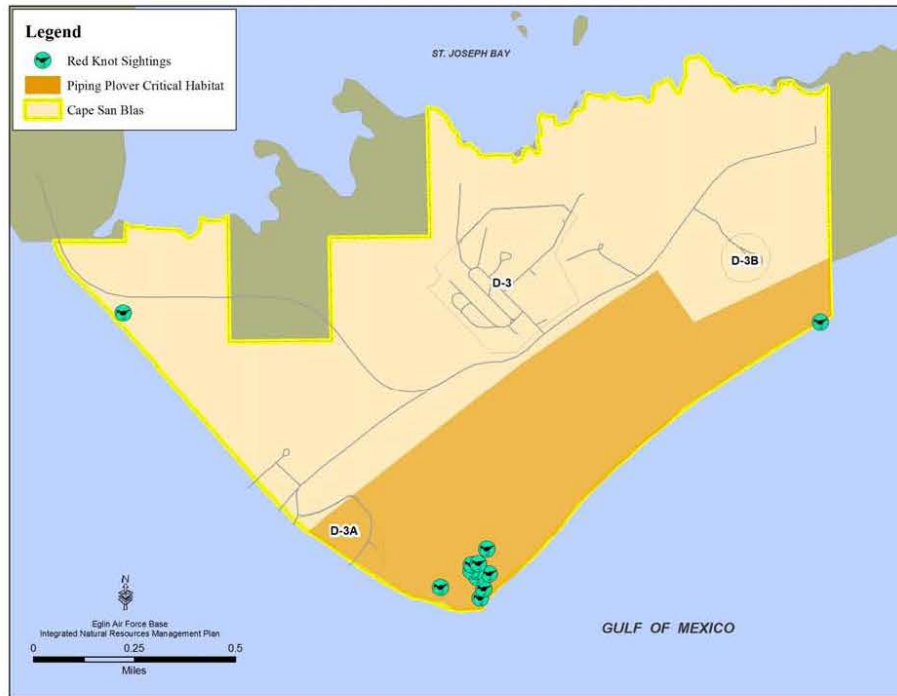


Figure 4-2. Sighting Locations of Red Knots at Cape San Blas

4.3 EFFECTS DETERMINATIONS

Although most INRMP either have no effect or beneficial effects for natural resources, certain management activities may adversely affect certain federally listed species (Table 4-3 and Table 4-4). The NRS will employ the conservation measures in Section 2.2.9 to minimize the negative side effects of INRMP activities.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-20

Effects Determination

Other Species Considered

Table 4-3. Effects Determinations for Eglin Mainland and SRI

INRMP Action	Eglin Mainland and SRI Species							
	RCW	Reticulated Flatwoods Salamander	Indigo Snake	Okaloosa Darter	Gulf Sturgeon and Critical Habitat	Sea Turtles	Piping Plover and Critical Habitat	Florida Perforate Lichen
Prescribed Fire								
Burn 90,000 acres annually (5-yr avg.), including: -avg. of 5 night burns/yr -no NRS personnel in the no and restricted suppression areas during active fire	LAA/BE	NLAA/BE		4(d) Rule	NE			
Wildfire Support								
Wildfire suppression activities following policy regarding biologically sensitive areas	NLAA/BE			NLAA		NE		
Forest Management								
Timber operations, including sand pine eradication and slash and longleaf thinning	NLAA/BE			NLAA		NE		
TSI hardwood control and sand pine removal								
Longleaf plantings, including site preparation (chopping or herbicides)				NLAA/BE				
Habitat Restoration (Non-fire/forestry)								
Erosion control and fish passage (earth moving and planting)	NLAA/BE			4(d) Rule	NLAA/BE	NE		
INPS treatment (herbicide and mechanical removal)	NLAA/BE							
Nuisance and Non-native Animal Management								
Feral hog control	BE					NE		
Beaver control	NE			BE	NE			
Coastal system predator control				NE		NLAA/BE	NLAA	
Ecological Monitoring								
Upland monitoring (sandhills, flatwoods)	NLAA/BE			NE		NE		
Aquatic monitoring	NE			NLAA/BE				

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-21

Effects Determination

Other Species Considered

Table 4-3. Effects Determinations for Eglin Mainland and SRI (cont'd)

Protected Species Management and Monitoring								
Protected species monitoring	Permitted	Permitted	NE	Permitted		NLAA/BE		
RCW cavity inserts and translocation		NE	NE	NE				
Hardwood control in flatwoods salamander ponds	NE	NLAA/BE		NE				
SRI sensitive habitat posting (lichen, plover, shorebirds, sea turtles)		NE		NLAA/BE				
Recreation Management								
Fishing	NE			NLAA	NLAA	NLAA	NLAA	NE
Fishpond management					NE			
Hunting	NLAA	NE	NE	NE	NE			
Food plots	NE							
Non-consumptive outdoor recreation	NLAA	NLAA	NLAA	NLAA		NLAA	NLAA	NLAA

avg. = average; BE = beneficial effect; INRMP = Integrated National Resources Plan; LAA = likely to adversely affect; LAA/BE = likely to adversely affect (individuals) with beneficial effects (population); NE = no effect; NLAA= not likely to adversely affect; NLAA/BE = not likely to adversely affect with beneficial impacts; RCW = red-cockaded woodpecker; SRI = Santa Rosa Island; RCW = red-cockaded woodpecker; yr = year

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-22

Effects Determination

Other Species Considered

Table 4-4. Effects Determinations for CSB

INRMP Action	CSB Species	
	Gulf Sturgeon and Critical Habitat	Piping Plover and Critical Habitat
Nuisance and Non-native Animal Management		
Coastal system predator control	NE	NLAA/BE
Protected Species Management and Monitoring		
Protected species monitoring	Permitted	
SRI sensitive habitat posting (plover, shorebirds, sea turtles)	NE	NLAA/BE
Recreation Management		
Fishing	NLAA	NE
Non-consumptive outdoor recreation, including beach driving		NLAA

BE = beneficial effect; CSB = Cape San Blas; INRMP = Integrated Natural Resources Management Plan; LAA = likely to adversely affect; LAA/BE= likely to adversely affect (individuals) with beneficial effects (population); NE = no effect; NLAA= not likely to adversely affect; NLAA/BE = not likely to adversely affect with beneficial impacts

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-23

Effects Determination

Other Species Considered

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04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 4-24

Conclusion**5. CONCLUSION**

Based on analysis of potential direct physical impacts, harassment, and habitat impacts associated with the Proposed Action, the RCW is the only protected species that is likely to be adversely affected by INRMP activities due to changes in policy for prescribed fire in UXO areas. Even with the implementation of conservation measures, negative impacts are anticipated for the RCW.

The NRS will notify the USFWS immediately if any of the actions considered in this Biological Assessment are modified or if additional information on listed species becomes available, as a reinitiation of consultation may be required. If impacts to listed species occur beyond what has been considered in this assessment, all operations will cease, and the USFWS will be notified. Any modifications or conditions resulting from consultation with the USFWS will be implemented prior to commencement of activities.

Conclusion

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04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 5-2

List of Preparers

6. LIST OF PREPARERS

Name/Title	Project Role	Experience
Hiers, Stephanie SAIC Environmental Scientist M.S. Conservation Ecology B.S. Biology	Author	13 years environmental science
Knight, Kelly SAIC Environmental Scientist M.S. Biology/Coastal Zone B.S. Biology	Author, GIS	9 years environmental science
Nunley, J. Michael SAIC Marine Scientist Environmental Scientist M.S. Marine Ecology B.A. Biology	Author, Project Manager	14 years environmental science

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 6-1

List of Preparers

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04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 6-2

References

7. REFERENCES

- Blalock-Herod, H. N., J. J. Herod, and J. D. Williams, 2002. Evaluation of conservation status, distribution, and reproductive characteristics of an endemic Gulf Coast freshwater mussel, *Lampsilis australis* (Bivalvia: Unionidae). *Biodiversity and Conservation*, 11: 1877-1887.
- Convery, K. M., and E. L. Walters, 2004. *Estimating species interactions in a woodpecker tree-hole community at the individual, population, and community levels*. Dissertation, Florida State University, Tallahassee.
- Federal Register, 1999. 64 FR 15691-15704, 50CFR17, *Endangered and Threatened Wildlife and Plants; Final Rule to List the Flatwoods Salamander as a Threatened Species*. April 1, 1999. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=1999_register&docid=99-7942-filed.pdf
- Federal Register, 2011. Fish and Wildlife Service Reclassification of the Okaloosa Darter from Endangered to Threatened and Special Rule. Vol. 76, No. 63 / Friday, April 1, 2011.
- Florida Department of Agriculture and Consumer Services (FDACS), 2011. *Best Management Practices for Silviculture*. Division of Forestry.
- Gault, K., 2009. Personal communication between Kathy Gault, Eglin Natural Resources Section, Wildlife, and Stephanie Hiers, SAIC. January.
- Hiers, J. K., S. C. Laine, J. J. Bachant, J. H. Furman, W. W. Greene, and V. Compton, 2003. Simple spatial modeling tool for prioritizing prescribed burning activities at the landscape scale. *Conservation Biology* 17:1571-1578.
- Jackson, J. A., M. R. Lennartz, and R. G. Hooper, 1979. Tree age and cavity initiation by red-cockaded woodpeckers. *Journal of Forestry*, Vol 77, No 2, pp 102-103.
- Johnson J., and K. Gault, 2012. Email communication between Mike Nunley and Justin Johnson and Kathy Gault about outdoor recreation and impacts to RCW. January 10, 2012.
- Pauly, G. B., O. Piskurek, and H. B. Shaffer, 2007. P hylogeographic concordance in the southeastern United States: the flatwoods salamander, *Ambystoma cingulatum*, as a test case. *Molecular Ecology*, Vol 16, pp 415-429.
- Pilarczyk, M. M., P. M. Stewart, D. N. Shelton, H. N. Blalock-Herod, and J. D. Williams, 2006. Current and recent historical freshwater mussel assemblages in the Gulf Coastal Plains. *Southeastern Naturalist*, 5(2): 205-226.
- U.S. Air Force, 2001. *Eglin Air Force Base Interstitial Areas, Biological Assessment to Determine Potential Impacts to Federally Listed Species Resulting from the Application of the Forest Herbicide Hexazinone on Eglin's Interstitial Forest Lands*. Biological Assessment Prepared for Informal Consultation by SAIC for the U.S. Fish and Wildlife Service. March.
- U.S. Air Force, 2002. *Integrated Natural Resources Management Plan (INRMP) 2002-2006*. AAC/EMSN, Department of the Air Force, Eglin AFB, Florida. May.
- U.S. Air Force, 2003. *Gyrotrack Section 7 consultation for fire break along urban interface*. 16 May, 2003.
- U.S. Air Force, 2006. *Threatened and Endangered Species Component Plan*. CEG/CEVSN Eglin AFB, FL. Flatwoods salamanders may disperse long distances from breeding sites to upland sites where they live as adults.
- U.S. Air Force, 2007a. U.S. Fish and Wildlife Service Informal Endangered Species Act Section 7 Consultation for Long-Term Vegetation Control on Eglin AFB. Programmatic Biological Assessment. March 2007.

04/24/12

Formal ESA Section Seven Consultation for the
INRMP Activities at
Eglin Air Force Base, Florida

Page 7-1

References

- U.S. Air Force, 2007b. *U.S. Air Force Final Environmental Assessment for Long-Term Vegetation Control on Eglin AFB*. October.
- U.S. Air Force, 2012. *Fire Management Decision Support System. Database for fire element CEG/CEVSNP Eglin AFB, FL*.
- Federal Register, 1999. Endangered and Threatened Wildlife and Plants; Final Rule to List the Flatwoods Salamander as a Threatened Species. Federal Register 62(241): 15691-15704.
- U.S. Fish & Wildlife Service (USFWS), 1999. *Cladonia perforata Recovery Plan Revision. May 18, 1999*
- U.S. Fish and Wildlife Service (USFWS), 2002. *Biological Opinion for Eglin AFB Integrated Natural Resources Management Plan (INRMP) 2002-2006*. U.S. Fish and Wildlife Service Panama City Field Office, FL.
- U.S. Fish and Wildlife Service (USFWS), 2003. *Recovery plan for the red-cockaded woodpecker (Picoides borealis)*, second revision. U.S. Fish and Wildlife Service, Atlanta, GA, 296 pp.
- U.S. Fish and Wildlife Service (USFWS), 2007. *National Bald Eagle Management Guidelines*. May.
- U.S. Fish and Wildlife Service (USFWS), 2008. *Hardwood Thinning Biological Assessment*. 21 August.
- U.S. Fish and Wildlife Service (USFWS), 2009. *Eastern Indigo Snake Programmatic Biological Opinion (BO)*. 18 February.
- U.S. Fish and Wildlife Service (USFWS), 2012. *USFWS Northeast Region Website: <http://www.fws.gov/northeast/redknot/>*. 17 April 2012.
- USFWS North Florida Ecological Services Office (NFESO), 2010. Loggerhead Sea Turtle (*Caretta caretta*). Accessed on 18 March 2010. <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/loggerhead-sea-turtle.htm>
- USFWS North Florida Field Office (NFFO), 2009a. Green Sea Turtle (*Chelonia mydas*). Accessed at <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/green-sea-turtle.htm>. Last updated on 16 January 2009.
- USFWS North Florida Field Office (NFFO), 2009b. Leatherback Sea Turtle (*Dermochelys coriacea*). Accessed at <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/leatherback-sea-turtle.htm>. Last updated on 16 January 2009.
- USFWS North Florida Field Office (NFFO), 2009c. Kemp's Ridley Sea Turtle (*Lepidochelys kempi*). <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/kemps-ridley-sea-turtle.htm>. Accessed on 20 July 2009.
- Williams, B.W., E.B. Moser, J.K. Hiers, K. Gault, and D.K. Thurber, 2004. Protecting Red-Cockaded Woodpecker Cavity Trees Predisposed to Fire-Induced Mortality. *The Journal of Wildlife Management* 70(3).

LETTER OF CONCURRENCE



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office

1601 Balboa Avenue

Panama City, FL 32405-3721

Tel: (850) 769-0552

Fax: (850) 763-2177

October 15, 2012

Mr. Thomas L. Chavers
Chief, Eglin Natural Resources Section
501 De Leon Street, Suite 101
Eglin AFB, FL 32542-5133

Attn: Mr. Bruce Hagedorn

Re: FWS Log Numbers:
FWS 04EF3000-2012-F-0180
FWS 04EF3000-2012-CPA-0068
FWS 04EF3000-2012-TA-0179
Date Started: February 12, 2012
Action Agency: Eglin Air Force Base
Project Title: 2012 – 2016 Eglin AFB INRMP
Location: Eglin Air Force Base
Ecosystem: Northeast Gulf
Okaloosa, Walton, and Santa Rosa Counties, FL

Dear Mr. Chavers:

This letter acknowledges the Fish and Wildlife Service's (Service) receipt of your letter dated May 17, 2012, requesting initiation of formal consultation in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) for your *Integrated Natural Resources Management Plan* (INRMP) activities on Eglin Air Force Base, Florida. We received the letter on May 25, 2012.

The INRMP is a programmatic document that details planned natural resources management activities over the next 5 years, including wildlife, fire, and forest management. The request for consultation concerns the implementation of these activities and the potential effects of the action on federally protected threatened and endangered species.

Eglin AFB's Natural Resource Section (NRS) has determined, and the Service concurs with the determination, that management actions as implemented within the INRMP would either not likely adversely affect (NLAA) or have no effect (NE) on: sea turtles (*Caretta caretta*, *Chelonia mydas*, *Lepidochelys kempii*, *Dermochelys coriacea*), reticulated flatwoods salamander (*Ambystoma bishop*) nor its critical habitat, okaloosa darter (*Etheostoma okaloosae*), eastern

2

indigo snake (*Drymarchon couperi*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*) nor its critical habitat, piping plover (*Charadrius melodus*) nor its critical habitat, the Florida perforate lichen (*Cladonia perforata*), nor any of the recently listed freshwater mussels (*Hamiota australis*, *Villosa choctawensis*, *Pleurobema strodeanum*, *Fusconaia Escambia*) based on incorporation of committed Conservation Measures into the project plans.

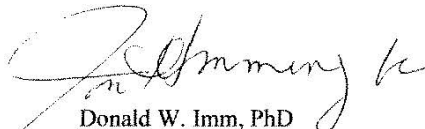
NRS has also determined that prescribed fire activities are likely to adversely affect (LAA) the red-cockaded woodpecker (RCW) (*Picoides borealis*). The Service concurs with your determination of MAA for the RCW. We have assigned log number FWS 04EF3000-2012-F-0180 to this consultation.

All the needed information to complete the consultation has been received by the Service. Therefore, all information required of you to initiate consultation has been provided and is adequate to prepare the biological opinion. Section 7 allows the Service up to 90 days to conclude formal consultation with your agency, and an additional 45 days to prepare our biological opinion (unless we mutually agree to an extension). Originally we anticipated providing our draft biological opinion by October 7, 2012 but in consult with Mr. Bruce Hagedorn, NRS staff, we decided that it would be most efficient for both the Service and Eglin's NRS staff to initiate a programmatic biological opinion (BO) for all actions within Eglin's NRS perview. We aim to get a draft RCW programmatic BO to Eglin's NRS Staff before November 16, 2012 and hope to finalize before December 14, 2012.

The Endangered Species Act requires that after initiation of formal consultation, the federal action agency make no irreversible or irretrievable commitment of resources that limits future options. This practice ensures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions or concerns about this consultation, please contact Ms. Patty Kelly at ext. 228.

Sincerely yours,



Donald W. Imm, PhD
Assistant Field Supervisor

Panama City FO:PKelly/LLehnhoff:10-15-2012:850-769-
0552x228.Server/Military/Eglin/INRMP2012/20121015INRMPConcur_PCTOFWS_NRS_ltr.doc.

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APPENDIX E

PUBLIC AND AGENCY OUTREACH

PUBLIC NOTIFICATION

In compliance with the National Environmental Policy Act, Eglin Air Force Base (AFB) announces the availability of the *Draft-Final Environmental Assessment for Integrated Natural Resources Management Plan Activities at Eglin Air Force Base, Florida*, and Draft Finding of No Significant Impact (FONSI), for public review.

The Eglin AFB Natural Resources Section (NRS) (96 CEG/CEVSN) is currently updating its *Integrated Natural Resources Management Plan* (INRMP) to guide the direction of natural resources management on Eglin's lands and in the waters beneath Eglin's over-water airspace during the next five years (2012 through 2016). The Eglin INRMP details planned natural resources management activities, including wildlife, fire, and forest management; the implementation of these activities is the Proposed Action for this EA.

Your comments on this Draft-Final Environmental Assessment (EA) are requested. Letters or other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names and respective comments of respondent individuals will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

Copies of the Draft-Final EA and Draft FONSI may be reviewed online at www.eglin.af.mil/eglindocuments.asp from November 26 until December 24, 2012. Local libraries have Internet access, and librarians can assist in accessing this document. Comments must be received by December 28, 2012, to be included in the Final EA.

For more information or to comment on these proposed actions, contact: Mike Spaits, 96 TW Public Affairs, 101 West D Ave., Ste. 238, Eglin AFB, Florida 32542 or email: mike.spaits@eglin.af.mil. Tel: (850) 882-2836; Fax: (850) 882-4894.

**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

MARJORY STONEMAN DOUGLAS BUILDING
3900 COMMONWEALTH BOULEVARD
TALLAHASSEE, FLORIDA 32399-3000

RICK SCOTT
GOVERNOR

JENNIFER CARROLL
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

January 14, 2013

Mr. W. Jamie McKee, Project Manager
Science Applications International Corporation
1130 North Eglin Parkway
Shalimar, FL 32579

RE: Department of the Air Force – Draft-Final Environmental Assessment for Integrated
Natural Resources Management Plan (INRMP) at Eglin Air Force Base – Santa Rosa,
Okaloosa and Walton Counties, Florida.
SAI # FL201211276431C

Dear Mr. McKee:

The Florida State Clearinghouse has coordinated a review of the Draft-Final Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

Based on the information contained in the Draft-Final EA and enclosed state agency comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of any issues identified during subsequent reviews. The state's final concurrence of the projects' consistency with the FCMP will be determined during the environmental permitting process, in accordance with Section 373.428, *Florida Statutes*, if applicable.

Thank you for the opportunity to review the INRMP document. Should you have any questions regarding this letter, please contact Ms. Jillaine M. Owens at (850) 245-2187.

Yours sincerely,

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/jmo
Enclosures

www.dep.state.fl.us



Project Information	
Project:	FL201211276431C
Comments Due:	01/04/2013
Letter Due:	01/20/2013
Description:	DEPARTMENT OF THE AIR FORCE - DRAFT-FINAL ENVIRONMENTAL ASSESSMENT FOR INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) AT EGLIN AIR FORCE BASE - SANTA ROSA, OKALOOSA AND WALTON COUNTIES, FLORIDA.
Keywords:	USAF - DFEA FOR INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AT EGLIN AFB
CFDA #:	12.200
Agency Comments:	
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	
Since no impacts are proposed at this time, the DEP's Northwest District Office in Pensacola has no comments. Please note, however, that if the scope of the proposed projects change to include impacts to jurisdictional wetlands and/or surface waters, the U.S. Air Force will likely be required to apply for and obtain an environmental resource permit under Chapter 62-346, Florida Administrative Code, for both wetlands impacts and stormwater management. In that case, please contact the DEP prior to submitting an application to discuss the specific scope of the project.	
STATE - FLORIDA DEPARTMENT OF STATE	
No Comment/Consistent	
WEST FLORIDA RPC - WEST FLORIDA REGIONAL PLANNING COUNCIL	
No Comments - generally consistent with the West Florida Strategic Regional Policy Plan.	
OKALOOSA - OKALOOSA COUNTY	
WALTON -	
TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION	
No Comments	
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION	
NO COMMENT BY BILLY SERMONS 12/4/12.	
NORTHWEST FLORIDA WMD - NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT	
No Comments/Consistent	
SANTA ROSA - SANTA ROSA COUNTY	

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
 TALLAHASSEE, FLORIDA 32399-3000
 TELEPHONE: (850) 245-2161
 FAX: (850) 245-2190

Visit the [Clearinghouse Home Page](#) to query other projects.

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COUNTY: ALL

SCH-106-USA-ES-1 NRMPS
2012-5508

DATE: 11/21/2012

COMMENTS DUE DATE: 1/4/2013

CLEARANCE DUE DATE: 1/20/2013

SAI#: FL201211276431C

MESSAGE:

STATE AGENCIES

ENVIRONMENTAL
PROTECTIONFISH and WILDLIFE
COMMISSION

X STATE

TRANSPORTATION

WATER MNGMNT.
DISTRICTS

NORTHWEST FLORIDA WMD

OPB POLICY
UNITRPCS & LOC
GOVS

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

DEPARTMENT OF THE AIR FORCE - DRAFT-FINAL ENVIRONMENTAL ASSESSMENT FOR INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) AT EGLIN AIR FORCE BASE - SANTA ROSA, OKALOOSA AND WALTON COUNTIES, FLORIDA.

To: Florida State Clearinghouse

EO. 12372/NEPA Federal Consistency

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

- ☒ No Comment
☐ Comment Attached
☐ Not Applicable
- ☒ No Comment/Consistent
☐ Consistent/Comments Attached
☐ Inconsistent/Comments Attached
☐ Not Applicable

From: Division of Historical Resources
Division/Bureau: Bureau of Historic Preservation

Reviewer: S. Edwards / Timothy A. Pearson, DSHPO

Date: 12/7/12

RECEIVED

DEC 18 2012

DHP Office of
Intergovernmental Programs